



TOOELE ARMY DEPOT
Tooele, Utah

**Monitoring Well C-41
Completion Report
Phase II RFI Groundwater
Investigation**

Contract Number: GS-10F-0179J



**US Army Corps
of Engineers®**

Submitted to:
U.S. Army Corps of Engineers
Sacramento District

December 2005



Prepared by:
PARSONS and **KLEINFELDER**
Salt Lake City, Utah

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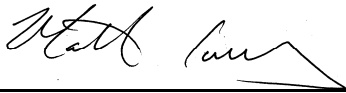
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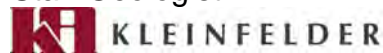
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TOOELE, UTAH**

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ABBREVIATIONS AND ACRONYMS

µg/L	micrograms per liter
ASC	Analytical Services Center
ASTM	American Society for Testing Materials
bgs	below ground surface
BRAC	Base Realignment and Closure
btoc	below top of casing
CTC	carbon tetrachloride
EPA	Environmental Protection Agency
gpm	gallon per minute
IWL	Industrial Wastewater Lagoon
MCL	maximum contaminant limit
NAD	North American Datum
NEB	Northeastern Boundary Plume
NGVD	National Geodetic Vertical Datum
NTU	nephelometric turbidity unit
NPL	National Priorities List
PCE	tetrachloroethylene
PDB	passive diffusion bag
PID	photoionization detector
ppm	parts per million
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SWMU	Solid Waste Management Unit
TCE	trichloroethene
TEAD	Tooele Army Depot
UAC	Utah Administrative Code
UID	Utah Industrial Depot
USACE	United States Army Corps of Engineers
USCS	Unified Soil Classification System
VOA	volatile organic analysis
VOC	volatile organic compound

1. INTRODUCTION

This report contains detailed information regarding the drilling, construction, development, and sampling of groundwater monitoring well C-41, located within the Base Realignment and Closure (BRAC) parcel on Tooele Army Depot, Utah (TEAD). This report was prepared for the U.S. Army Corps of Engineers (USACE), Sacramento District, under Contract GS-10F-0179J, on behalf of TEAD by Kleinfelder, Inc., (Kleinfelder) and Parsons in Salt Lake City, Utah.

TEAD is an active military facility located approximately 35 miles southwest of Salt Lake City, Utah (Figure 1.1) and it has been in operation since 1942. TEAD has been a primary storage, maintenance, and disposal facility for conventional munitions since its inception. Due to impacts to groundwater quality resulting from this activity, TEAD was added to the National Priorities List (NPL) under the federal Superfund program in October 1990.

1.1 BACKGROUND INFORMATION

Historical wastewater discharges to the unlined Industrial Wastewater Lagoon (IWL) at TEAD resulted in a large impacted groundwater plume beneath the eastern portion of the Depot. A large number of monitoring wells, piezometers, extraction wells, and injection wells have defined a trichloroethene (TCE) plume along downgradient, northern, and western extremes of the Depot. This occurrence of impacted groundwater was designated the Main Plume.

In 1986, TCE was detected in an offsite production well located north of the Industrial Area, approximately 5,000 feet northeast of the IWL. In 1994, well C-10 was installed at the northeastern boundary of the Depot. TCE was detected at a concentration of approximately 240 micrograms per liter ($\mu\text{g/L}$) in groundwater sampled from Well C-10, located directly across the road from the impacted offsite production well (Kleinfelder, 1998).

Additional groundwater investigations were conducted to further assess the nature and extent of groundwater contamination at the northeastern boundary of TEAD. These additional investigations indicated that the contamination in well C-10 and the adjacent offsite production well had likely originated from a source different from that attributed to the Main TCE plume. Thus, two plumes of groundwater contamination were indicated. This second, more easterly plume, was designated the Northeastern Boundary (NEB) Plume. The oil-water separator at Building 679 in the former industrial area (now the privately owned Utah Industrial Depot [UID]) was identified as a major source of this plume (Kleinfelder, 2002).

A subsequent investigation was designed to define the approximate offsite extent of the NEB Plume. The plume, which is relatively narrow beneath the former industrial area, extends

approximately 16,000 feet downgradient (to the north) from the identified source at Building 679 (Parsons, 2003a). The installation of groundwater monitoring well C-41 was conducted in accordance with the Phase II Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Solid Waste Management Unit (SWMU) 58 Work Plan (Parsons, 2003b) and Work Plan Sampling and Analysis Plan Addendum 1 (Parsons, 2004) that were approved by the U.S. Army and the State of Utah prior to initiating fieldwork.

1.2 PROJECT PURPOSE AND SCOPE

Monitoring well C-41 is one of eight groundwater monitoring wells installed between September 2004 and January 2005 during the Phase II RFI at SWMU 58. SWMU 58 encompasses the source area and the area impacted by the Main and NEB TCE Plumes. Objectives of the groundwater investigative component of the Phase II RFI are to:

- Refine the vertical limits and lateral extent of the Main and NEB chlorinated solvent plumes;
- Further characterize the distribution of contaminants within the plumes
- Ascertain whether there are additional contaminant sources to the NEB Plume and assess their impacts to groundwater;
- Assess the risks to human health associated with the unmanaged (offsite) portion of the NEB Plume; and
- Refine the existing numerical groundwater flow and solute transport models with respect to fate and transport, in order to better predict the potential extent (stability) of the plume in the future.

Investigative efforts described in this completion report were supervised by a Kleinfelder State of Utah-registered geologist who was present for critical on-site activities. Before drilling began, an Excavation Permit was obtained from UID and a permit for well construction was obtained from the State of Utah Division of Water Rights. Copies of the Excavation Permit, Request and Authorization letters, and the Driller's Start Card are included in Appendix A. Underground utility clearance was obtained through Blue Stakes Location Center and UID.

Monitoring well C-41 was drilled, constructed, developed, and sampled between October 28, 2004, and January 3, 2005. Drilling and construction activities were conducted by Layne Geoconstruction (Layne) of Salt Lake City, Utah. Following completion of the well, Layne submitted a Well Driller's Report, which is included in Appendix A. Well development and groundwater sampling were completed by Veolia Water North American Operating Services, LLC (Veolia Water), which operates the groundwater treatment plant at TEAD. Laboratory analyses were provided by Analytical Services Center (ASC) of Lancaster, New York, a division of Ecology and Environmental, Inc. (E and E), which is a State of Utah and a USACE-validated

analytical laboratory. Down-hole geophysical logging was performed by RAS, Inc. (RAS) of Golden, Colorado.

Monitoring well C-41 is located in the NE ¼ of Section 30, T3S, R4W, Salt Lake Base and Meridian within the BRAC parcel at the north end of the UID. The primary reason for the installation of monitoring well C-41 at this site was to better define the centerline of the NEB plume in this area. A second objective was to assess, based on the suite and concentrations of VOCs present, if the contamination was derived solely from the oil-water separator at Building 679, or if one or more as yet unidentified contaminant sources at the north end of UID might be contributing to the chlorinated solvent mass in shallow groundwater (Parsons, 2003b).

2. DRILLING, SAMPLING, AND LOGGING METHODS

2.1 DRILLING

Groundwater monitoring well C-41 was drilled by Layne Geoconstruction of Salt Lake City, Utah, between October 28th and November 2nd, 2004 using a Becker AP-1000 percussion hammer drilling rig manufactured by Drill Systems. The AP-1000 advances a dual-walled 10-inch diameter drill pipe into the subsurface by means of a diesel-powered pile hammer. Circulating air is pumped down the space between the inner and outer walls of the drill rod to the drill bit, where formation cuttings are picked up and carried back through the center of the drill rod and out of the borehole as the air returns to the ground surface. Cuttings are separated from the discharging air by a cyclone. Dry cuttings were collected and spread on the ground around the well site whereas saturated cuttings were contained in 55-gallon drums pending analytical results.

2.2 SAMPLING OF DRILL CUTTINGS

Cuttings were observed continuously as they discharged from the cyclone and were collected in 1-quart bags and chip trays. The cuttings were collected and logged at 5-foot intervals or when significant changes in lithology occurred. Drive sampling in previous boreholes during this program was rarely successful due to refusal in coarse sediments and inability to predict where thin fine-grained layers would occur. Thus, a more accurate and complete borehole log resulted from continuous observation of cuttings from the cyclone.

Drill cuttings were logged using the American Society for Testing Materials (ASTM) Method D2488-00. The Unified Soil Classification System (USCS) was used for designating the various types of unconsolidated material encountered. Where a conflict between the two methods was identified, the ASTM convention took precedence. Color of the drill cuttings (when wetted) was noted by referencing the Munsell color chart system. Estimated percentages of gravel, sands, and fines; degree of roundness and lithology/mineralogy of any gravel clasts; moisture content; degree of cementation; and any other notable attributes were routinely recorded in the sample description. The Becker Hammer Drilling method allows for a maximum clast size of about 6 inches to pass through the drill pipe to the surface. While boulders and cobbles exceeding this dimension may occur over certain intervals, their percentages cannot be estimated.

Grab samples of drill cuttings from below the saturated zone were logged and screened for volatile organic compounds (VOCs) using an Environmental Instruments photoionization detector (PID). PID readings were also included on the boring log. PID readings from the grab samples from this boring ranged from 0.0 to 1.0 parts per million (ppm). A composite of these samples was submitted for VOC analysis, which was used to determine the proper means of

disposal for all saturated cuttings from this borehole. Saturated drill cuttings were containerized in 55-gallon drums and transported to the UID 90-day yard to await analysis.

2.3 RECORD KEEPING

While on site, Kleinfelder's geologist maintained records of all activities in a bound field log book, on Daily Field Report forms, Drill Rig Inspection forms, Safety Meeting Forms, and Equipment Calibration Logs. Copies of these records are presented in Appendix B.

3. SUMMARY OF SUBSURFACE CONDITIONS

3.1 GEOLOGIC LOG

A Kleinfelder geologist was on site during drilling and sediment sampling in order to maintain a continuous geologic log of the subsurface conditions that were encountered. Lithologic descriptions and the geologist's observations were entered onto the geologic log. The geologic log of the cuttings that were sampled during drilling of monitoring well C-41 borehole is included in Appendix C as Plate C-1.

The geologic log indicates that the boring was drilled in unconsolidated valley fill sediments from the ground surface to a total depth of 375 feet below ground surface (bgs). The coarser-grained sediments (i.e., gravels) are interpreted to have been deposited in a dynamic high energy depositional environment of coalescing alluvial fans. They are interpreted to represent one or more of several types of alluvial fan deposits, including debris flow, stream channel, sheetflood, and sieve, that have been defined (Collinson, 1978) based on depositional process, location on the fan, deposit morphology, degree of sorting and bedding, etc. Most of the subsurface sediments were poorly graded sand and gravel with varying amounts of boulders, cobbles, silt, and clay. The majority of the coarse grained sediments consisted of sub-rounded to sub-angular clasts of quartzite and limestone that appeared water-worn. While some angular clasts are observed, these are likely products of the mechanical breaking caused by the drilling method.

Horizons of less permeable fine-grained sediments were encountered at depths of 0-6, 245-247, 320-323, 335-338, and 364-367 feet bgs as indicated on the geologic log. While some of the finer-grained clay- and/or silt-rich sediment occurrences may be of lacustrine or floodplain origin, others may represent debris flows (Collinson, 1978) and/or possibly stream overbank deposits.

The geologic log also indicates that some weak to moderately cemented and strongly cemented zones were also encountered at depths of 154-156, 234-235, 236-238, 245-250, 251-252, 254-256, 257-259, 261-262, 265-266, 267-268, 273-275, 278-279, 323-326, 339-342, 351-359, and 371-372 feet bgs. No bedrock was encountered during drilling of monitoring well C-41.

Free water from the cyclone was first observed at approximately 350 feet bgs during drilling. The depth to water was measured at 338.76 feet below top of casing (btoc) by Veolia Water after the well was constructed and developed. Perched water was not encountered during drilling of monitoring well C-41.

3.2 GEOPHYSICAL LOGS

As a secondary interpretive tool, down-hole geophysical logging of monitoring well C-41 was completed within the polyvinyl chloride (PVC) cased well following construction. Natural gamma ray (gamma) and induction electric (induction) logs were run simultaneously by RAS on December 8th, 2004 using a combination gamma ray-induction tool manufactured by Century Geophysical Corporation of Tulsa, Oklahoma. The gamma and induction logs for this well are contained in Appendix C. Data validation was attained via a repeat logging run of a selected stratigraphic interval within the well. On a separate log printout in Appendix C the borehole geology has been added, and an attempt has been made to correlate pronounced gamma and induction electric highs and lows with fine-grained, generally clay-rich units and caliche-cemented zones. The reader should refer to that multipage printout when reviewing the comments presented below concerning the description and interpretation of the geophysical logs.

The gamma logging technique measures the natural gamma emissions emanating from the formation surrounding the borehole. This radiation is released from nuclei of an unstable element decaying to a more stable element. Potassium-40 is the element responsible for most of the gamma radiation detected by the gamma ray probe. This element is very abundant in a number of rock-forming minerals, such as potassium feldspar, that weather to clays. Hence, as the clay content of the sediment increases the gamma ray response also increases. Thorium- and uranium-bearing minerals also produce a gamma ray response, but in most geologic environments, including the unconsolidated valley fill deposits at the project site, the potassium-40 isotope is most abundant. Conversely, the gamma response becomes progressively weaker as the quartz content of the sediment increases. A comparison of this and other monitor well boring logs with their respective gamma ray logs shows a very strong correlation between finer-grained, clay-rich units and gamma ray peaks. Slight offsets between a gamma peak and the location of the fine-grained interval are attributed to an inability to exactly define the depths of unit contacts owing to the time required for the cuttings to travel up the borehole and reach the surface. The measurement scale of the gamma-ray log is in API (American Petroleum Institute) units, accepted as the international reference standard that allows consistent comparisons to be made between a wide variety of gamma-ray counting devices.

The gamma ray response for this well is fairly consistent with almost all readings falling between 20 and 50 API units. This signature is compatible with the general absence of fine-grained clay-rich intervals as verified by the geologic log. A few gamma ray peaks of about 75 API units were generated at about 27 and 351 ft but these do not appear to correlate with any clay-rich units according to the borehole log. Conversely, only two of the fine-grained clay-rich units (@ 245-247 and 335-338 ft) of those noted in section 3.1 appear to have a perceptible gamma response. Moreover, the magnitude of the associated peaks for those two intervals is similar to that for the over- and underlying gravel units. Thus, it is questionable if either occurrence would be identified solely by a review of the gamma log for this well. The absence of

a more pronounced response for those zones may reflect one or more factors including clay mineralogy, e.g., a lack of potassium-bearing clay minerals such as illite.

The induction log measures the conductivity from high frequency alternating currents that are induced into the geologic formation, and is best suited where the formation is characterized by low to medium (less than 50 ohm-meters) resistivity values, the geologic medium exhibits medium to high porosity, and the open borehole was advanced using mud or air as the drilling fluid. Induction logging can be performed in boreholes cased with PVC, but not with steel pipe. Although the induction device measures conductivity, by convention the conductivity readings are converted to a resistivity curve when plotted on a down-hole log via a simple inverse relationship.

Three curves are shown on the induction logs that were run by RAS. They represent the direct conductivity (millimhos/meter) readings as designated by a dashed (“cond”) curve on the plot, a conductivity (“ap-cond”) curve designated by a dotted line that has been corrected for the temperature of the induction probe, and resistivity (ohm-meters) measurements derived from a conversion of the temperature-corrected conductivity readings that are depicted as a solid (“res”) line on the induction log plot. Note that although the conductivity and resistivity curves appear to mimic one another, the scales for the two properties are reversed since their relationship is an inverse one.

The resistivity and conductivity curves display considerable fluctuations within the coarse-grained gravel-bearing units. Such variation is interpreted to reflect differences in porosity, clay content of the sediments. Several of clay-rich units identified on the geologic log are marked by resistivity lows and conductivity highs as might be expected. However, these lows fall within the background interval, and thus by themselves are not diagnostic of fine-grained clay-rich sediments. A number of resistivity peaks, including the two strongest at about 360 and 372 ft, both of which went off scale, correspond to caliche-cemented zones primarily in the gravels. Also note a sharp resistivity spike at about 58 ft that remains unexplained. Nevertheless, most of the associated resistivity highs are within the range of readings considered to represent background.

In summary, the induction electric and gamma logs appear consistent with the subsurface conditions as interpreted from the drilling response and geologic logging of the drill cuttings.

3.3 HYDROSTRATIGRAPHIC SECTION

To aid in understanding the subsurface geology and water table configuration in the vicinity of this monitoring well boring, the geologic log for this well was included on a straight line cross section trending northwest-southeast over a distance of approximately 6,000 feet that is also defined by monitoring wells C-42F, C-43F, C-44, and C-45 (Plate C-4). All of the wells except

C-41 were projected onto this section. Projection distances are provided on the cross section. The location of this cross section (A – A') is shown on Plate C-3. Note that only cross section A - A' is provided in this well completion report, since it is the only section that illustrates a simplified stratigraphic strip log of C-41.

Study of the cross section suggests that the predominantly fine-grained sediment units do not appear to be laterally continuous between the five C-series wells that lie on or have been projected onto Cross Section A–A'. Thus, the correlation of these units from borehole to borehole is poor. This is partially due to the substantial distances between them (up to ½ mile). However, even for boreholes that are relatively close to each other (e.g., C-41 and C-42F are approximately 800 feet apart), little correlation appears to exist between units.

The difficulty in correlating distinct fine-grained units is not surprising, given that the unconsolidated valley fill within SWMU-58 was largely deposited in a dynamic high energy depositional environment of coalescing alluvial fans. Fine-grained units deposited under such conditions are characterized by limited thickness and areal extent, and this also appears to hold true for the project area, in addition to well boring C-41. Many of the fine-grained silt- and/or clay-rich intervals pinch out over a few hundred ft due to a change in the depositional environment.

Another plausible explanation for limited areal extent is post-depositional erosion and sediment reworking. Channel erosion is strongly suspected of causing the substantial difference in the thickness of a clay-rich lacustrine or floodplain deposit encountered in two closely spaced borings at Building 600 in the Utah Industrial Depot. It almost certainly has been operative elsewhere.

There is another factor that may frustrate correlation of fine-grained units in this and other Phase II RFI groundwater monitoring wells. Most of these fine-grained units, even if they exhibit some lateral extent, were generally deposited on inclined alluvial fan surfaces sloping several degrees or more. Over a distance of just a few hundred feet a dip of even a few degrees translates into a change in elevation of up to ten feet or more. Moreover, for monitoring wells spaced a thousand feet or greater, which is not atypical for the groundwater monitoring array at TEAD, differences in the elevation of a laterally continuous unit could be on the order of several tens of feet.

As per the fine-grained units, little success has been achieved attempting to correlate caliche-cemented zones that occur primarily in the gravels. The same general comments presented above for fine-grained sediment deposits also apply to correlation of cemented zones. The ability to correlate both fine-grained sediment units and cemented zones between monitoring wells in the project area may be contingent upon the quality of the downhole gamma and induction electric logs for those wells.

4. WELL CONSTRUCTION SUMMARY

4.1 CONSTRUCTION TECHNIQUES AND MATERIALS

During drilling of monitoring well C-41, the 10-inch Becker Hammer drive casing was advanced to a depth of approximately 376 feet bgs. Well construction occurred on November 3rd and 4th, 2004. Monitoring well C-41 was constructed inside drive casing and the bottom of the well was tagged at a depth of 375.79 feet bgs. Two 10-foot sections of threaded, 4-inch diameter Schedule 40 PVC well screen with 0.010-inch wide slots and 36 10-foot sections of 4-inch diameter Schedule 40 PVC blank casing were assembled and lowered inside the drive casing to the bottom of the borehole. The screen extends from 355.79 feet to 375.79 feet bgs. The well riser consists of 2.38 feet of aboveground blank well casing.

Silica sand (16-40) was added to the annulus between the PVC and the borehole in the interval adjacent to the well screen. To help minimize the risk of bridging and to confirm that the correct volume of sand was added, the sand was poured slowly into the annulus from the surface and continuously monitored until the top of the sand interval was approximately 5 feet above the top of the screen. The sand-pack interval was isolated from upper portions of the borehole with a 9-foot thick seal of bentonite clay pellets. The remaining annulus above the bentonite clay pellets was grouted to approximately 30 inches bgs with 30 percent solids bentonite slurry in accordance with Utah Administrative Code (UAC) R655-4-9.4.2. A well construction diagram is provided in Appendix D.

4.2 SURFACE COMPLETION AND SURVEY COORDINATES

The surface completion was constructed on November 5th, 2004. A locking 6-foot long, 10-inch diameter steel protective casing was placed around the uppermost part of the monitoring well casing, with approximately 3 feet above and 3 feet below ground. Concrete was used to partially fill and anchor the protective casing, fill the upper 5 feet of the borehole annulus, and build a 3-foot square by 1-foot thick pad (6 inches above ground surface) around the finished well. The concrete pad was finished to slope away from the protective casing and was embedded with a brass survey monument.

Four 4-inch diameter steel bollards were positioned around the pad to protect it from vehicular traffic. The bollards stand approximately 4 feet above the ground surface and extend about 2 feet bgs into concrete-filled post holes.

Ward Engineering Group of Salt Lake City, Utah, surveyed the well on December 10, 2004. Coordinates for the well locations are referenced to the North American Datum (NAD) 1983 Utah State Plane Central Zone and the elevation to the National Geodetic Vertical Datum (NGVD) 1929. Survey data are included in Appendix D.

5. WELL DEVELOPMENT

Groundwater monitoring well C-41 was developed using swabbing, bailing, and pumping methods on November 9 and 10, 2004. Development continued for 6 hours and 17 minutes until the turbidity of the water produced was less than five nephelometric turbidity units (NTUs). All development water was collected and contained for later disposal pending analytical results (see Section 7.3). Well development records are included in Appendix E.

5.1 SWABBING AND BAILING

Swabbing and bailing took place for approximately 3 hours and 18 minutes. Swabbing was done with a loose fitting surge block with an oversized rubber disk, slightly smaller than the inner diameter of the screen. Periodic measurements of pH, temperature, electrical conductivity, turbidity, and comments regarding the appearance of discharge water were recorded on well development records (Appendix E). Approximately 105 gallons of water were removed from well C-41 by bailing during development.

5.2 PUMPING

After swabbing and bailing the well, development was completed using an electric submersible pump. The pump was lowered to the bottom of the screened interval and operated intermittently at rates ranging from 4.09 to 4.23 gallons per minute (gpm) for approximately 2 hours and 59 minutes. During development pumping, the pump was periodically shut off and the water in the discharge piping was allowed to back-flush (surge) into the well. Pumping and periodic back-flush surging was continued until there was no noticeable increase in the discharge water turbidity. Periodic measurements of pH, temperature, electrical conductivity, turbidity, and comments regarding the appearance of discharge water were recorded on well development records. A total of 560 gallons of groundwater were removed by development pumping. The final turbidity was measured at 0.81 NTU.

6. GROUNDWATER SAMPLING

6.1 SAMPLING METHODOLOGY

Monitoring well C-41 was sampled using passive diffusion bag (PDB) sampling techniques. PDB sampling is performed without purging and involves lowering a polypropylene bag filled with distilled water to a predetermined depth. Once in place, the water within the PDB sampler is allowed to equilibrate with the surrounding groundwater for two weeks. During this time, VOCs diffuse into the distilled water. The PDB sampler is then removed from the well and water is transferred into three pre-preserved 40 mL volatile organic analysis (VOA) vials.

Four PDB samplers were placed in monitoring well C-41 on December 20, 2004. Two samplers were placed at a depth of 358 feet btoc, one sampler was placed at a depth of 368 feet, and one sampler was placed at a depth of 378 feet btoc. The PDB samplers were retrieved from well C-41 and sampled on January 3, 2005. Groundwater samples collected from well C-41 were assigned sample numbers C-41GW001, C-41FD001, C-41GW002, and C-41GW003.

After the sample containers were filled, they were placed into an ice-chilled cooler and shipped overnight to ASC, a State of Utah and USACE-certified analytical laboratory, for VOC analysis. Chain-of-custody forms were filled out and used to document the sampling dates, analytical parameters requested, and proper sample handling. Completed chain-of-custody forms and cooler receipt forms are included in Appendix F.

6.2 GROUNDWATER ANALYTICAL RESULTS

Analysis for VOCs was completed using U.S. Environmental Protection Agency (EPA) Method 8260B. The highest VOC detection in the groundwater from C-41 was TCE (18.7 µg/L) in a sample taken from 358 feet btoc. That analyte was detected at all three depths. Carbon tetrachloride (CTC) was also detected at the three depths, with the highest concentration (0.251 µg/L) reported at 358 feet btoc. No other VOCs were reported. The sampling results from monitoring well C-41 are summarized in Table 1. Laboratory reports summarizing the results of groundwater analysis from C-41 are included in Appendix F.

TABLE 1

SUMMARY OF LABORATORY RESULTS

TOOELE ARMY DEPOT, UTAH

Analyte	Federal MCL (µg/L) 95 40CFR 141.11, 141.12, 141.61, & 141.62	Analytical Results (µg/L)			
Sample Number & Depth		C-41GW001 (358 feet)	C-41FD001 (358 feet)	C-41GW002 (368 feet)	C-41GW003 (378 feet)
1,1,1 Trichloroethane	200	ND	ND	ND	ND
1,1,2 Trichloroethane	5	ND	ND	ND	ND
1,1 Dichloroethane	5	ND	ND	ND	ND
1,1 Dichloroethene		ND	ND	ND	ND
1,2 Dichloroethane	5	ND	ND	ND	ND
1,2 Dichloropropane	5	ND	ND	ND	ND
Benzene	5	ND	ND	ND	ND
Carbon tetrachloride	5	0.229	0.251	0.237	0.231
Chloroethane		ND	ND	ND	ND
Chloroform	100	ND	ND	ND	ND
cis 1,2 Dichloroethene		ND	ND	ND	ND
Ethylbenzene	700	ND	ND	ND	ND
m,p Xylene	10,000	ND	ND	ND	ND
Methylene chloride	3	ND	ND	ND	ND
Naphthalene		ND	ND	ND	ND
o Xylene	10,000	ND	ND	ND	ND
Tetrachloroethene		ND	ND	ND	ND
Toluene	1,000	ND	ND	ND	ND
trans 1,2 Dichloroethene		ND	ND	ND	ND
Trichloroethene	5	18.7	18.5	18.4	15.5
Vinyl chloride	2	ND	ND	ND	ND

The very low concentrations of TCE reported for this well from the initial (well installation) sampling event would suggest that it is positioned along the margin of the NEB Plume. TCE results for well C-42F suggest that the centerline of the plume is situated to the west of C-41. It is somewhat puzzling that the reported TCE concentrations are not higher, given the relatively short distance (~1100 ft) between this monitoring well and the main or sole contaminant source of the NEB Plume at Building 679 (as marked by well C-33 on Plate C-3).

Reported carbon tetrachloride concentrations are consistent with the results reported for nearby monitoring well C-24, but provide no additional insight as to a possible source or sources.

The reported TCE value at 378 ft btoc suggests that concentrations may be decreasing with depth. In contrast, the CTC data do not suggest any stratification or decline in concentration as a function of depth.

7. INSTALLATION RESTORATION WASTE

7.1 DECONTAMINATION METHODS

To help minimize the chance that non-dedicated equipment could cross-contaminate groundwater or drill cuttings at well C-41, a rigorous decontamination program was followed. A decontamination station was constructed in the temporary UID RCRA 90-day yard (located south of building 614) that could accommodate the drill rig, drill pipe, and other equipment as needed. Decontamination of equipment was conducted with approved water from TEAD production well WW-3 using a steam cleaner/high-pressure washer. Equipment wash and rinse water were contained in a sump within the decontamination station, and then pumped to a Baker tank in the UID 90-day yard where it was managed as suspect hazardous waste.

7.2 DISPOSAL OF DRILL CUTTINGS

Drill cuttings from the unsaturated zone were collected below the cyclone in a wheelbarrow and spread evenly on the ground around the well site. Once groundwater was encountered, saturated cuttings were containerized in 55-gallon drums and transported to the UID 90-day yard. A saturated sample was collected every 5 feet and, upon completion of the borehole, these samples were composited to a single sample and submitted for laboratory analysis for VOCs. Lab results indicated VOCs were not detected in the sediments from well C-41. Following approval by the TEAD environmental office, the cuttings were returned to the well site and spread on the ground surface. A copy of the laboratory results is included in Appendix G.

7.3 DISPOSAL OF WASTEWATER

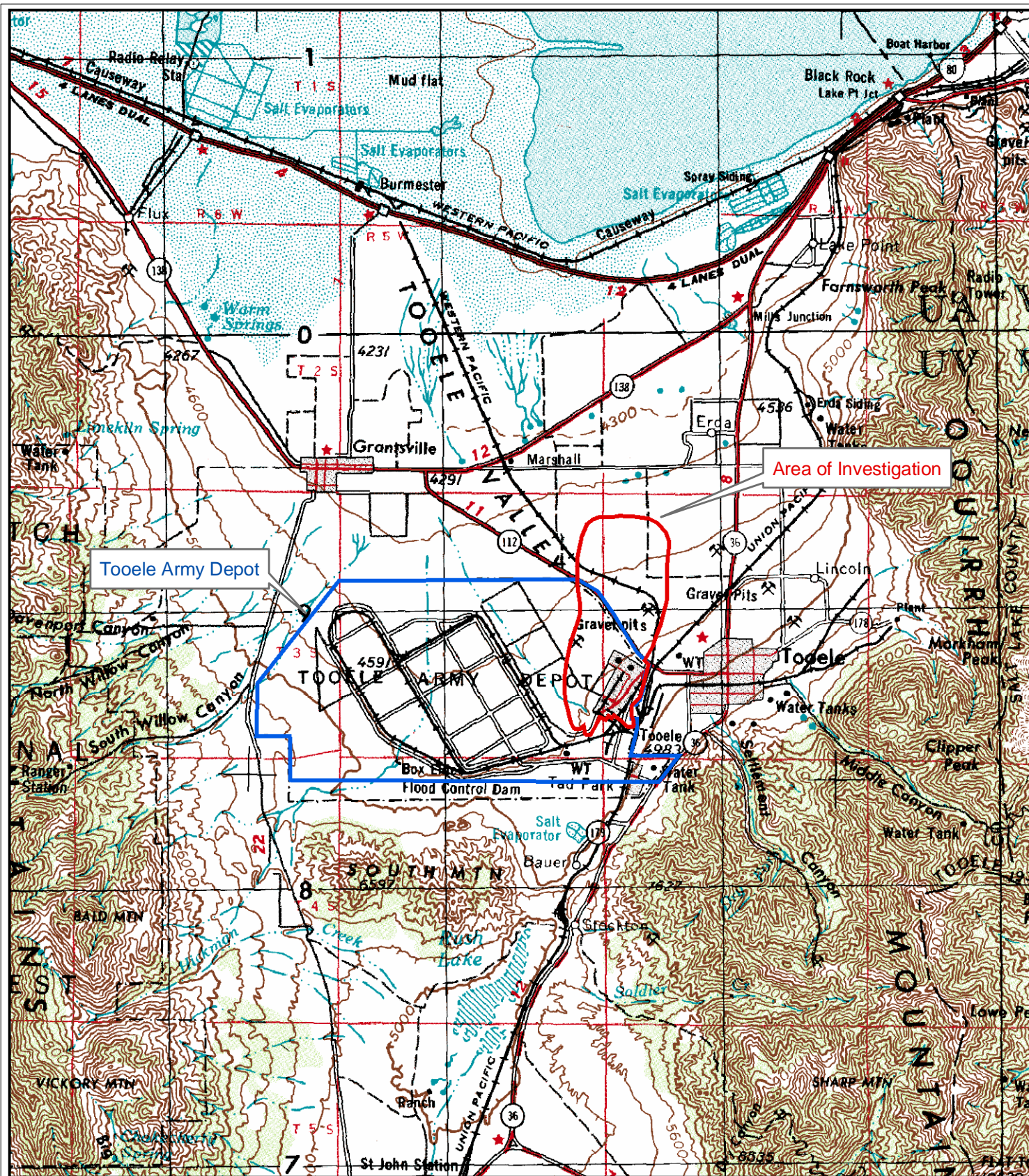
Water derived from the drilling and development of well C-41, including equipment rinse water, was transported from the well site to the UID temporary 90-day yard by Veolia Water using a 1,000-gallon capacity polytank mounted on a dual axle trailer, and then pumped into a 6,500-gallon capacity Baker tank.

Eventually the water was commingled in a 6,500-gallon capacity Baker tank with development and equipment rinse water derived from nearby wells C-44, C-42F, and C-43F. Commingling of the waste streams from these wells was justified because these four C-series wells lie within the NEB Plume. Consequently, for IRW management purposes it was assumed the development water from these wells would be impacted by chlorinated solvents and have similar waste characteristics. In addition to water from these wells, equipment rinse water generated from deep soil boring I610-VPB001 was added this waste stream.

After development and decontamination water from well C-43F (the last of the four wells drilled) was added to the tank, it was closed and sampled to determine the most suitable disposal option for this waste stream. Sample IDW21 contained 155 µg/L TCE, 1.09 µg/L tetrachloroethylene (PCE), 0.167 µg/L chloroform, and 0.761 µg/L CTC. The waste was coded as F001 and F002 hazardous. Based on this analysis, the water met the requirements for processing at the TEAD GWTP, and this disposal option was recommended to TEAD. A copy of the disposal memo is included in Appendix H. Following authorization by TEAD the waste was transferred to the TEAD groundwater treatment plant on January 5, 2005, via a 6,000-gallon capacity tanker provided by MP Environmental.

8. REFERENCES

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- Kleinfelder. 1998. Northeast Boundary Groundwater Investigation Report of Findings (Vol. I), Tooele Army Depot, Tooele, Utah. Salt Lake City.
- Kleinfelder. 2002. Final Phase I RCRA Facility Investigation Report for SWMU-58 for Tooele Army Depot, Tooele, Utah. Salt Lake City.
- Parsons, 2003a. Final Addendum to Phase I RCRA Facility Investigation Report for SWMU 58: Groundwater Investigation – Offsite Portion of Northeast Boundary Area. Tooele Army Depot, Utah. August.
- Parsons. 2003b. Final Phase II RCRA Facility Investigation SWMU-58 Work Plan for Tooele Army Depot, Tooele, Utah.
- Parsons. 2004. Final Phase II RCRA Facility Investigation SWMU-58 Work Plan, Sampling and Analysis Plan, Addendum 1 for Tooele Army Depot, Tooele, Utah.
- Welenco, 1996. Water and Environmental geophysical Well Logs: Volume 1—Technical Information and Data, 8th edition.



LEGEND

- Installation Boundary
- Investigation Boundary

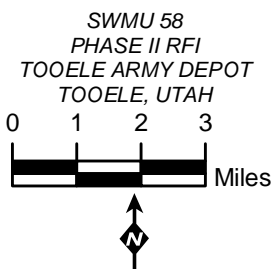
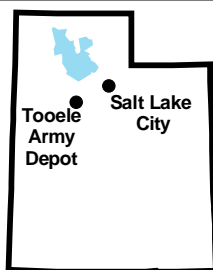


FIGURE 1.1
SITE
LOCATION
MAP

Source: USGS Tooele, Utah 1 x 2 Quadrangle, 1970

APPENDIX A

DB

APPENDIX A
EXCAVATION PERMIT
(Proponent Agency is Installation Support Division)
(TEAD-R 420-16)

EXCAVATION REQUESTED BY Parsons Co. PHONE (801) 572-5999
LOCATION OF EXCAVATION Northeast of Utah Industrial Depot
PURPOSE OF EXCAVATION Environmental Investigation
NAME OF DIRECTOR TO NOTIFY THAT EXCAVATION IS TAKING PLACE IN OR NEAR A
BUILDING OR FACILITY UNDER THEIR RESPONSIBILITY _____
DATE DIRECTOR WAS NOTIFIED _____

NOTIFICATION SHALL BE MADE 24 HOURS IN ADVANCE

BASED UPON DRAWINGS AVAILABLE AND PERSONAL KNOWLEDGE OF THE AREA FOR WHICH I
AM RESPONSIBLE, THE SITE IS FREE OF UNDERGROUND FACILITIES OR SYSTEMS EXCEPT
AS NOTED:

REALITY SPECIALIST-BLDG 501 Dea Chaudhri 8/5/04
FACILITIES SUPPORT DIVISION-Bldg 516 [Signature]
COMMUNICATIONS CONTRACTOR-Bldg 10 [Signature] 8-5-04
COAXIAL CABLE MANAGER-Bldg 10 [Signature]
ENVIRONMENTAL OFFICE-Bldg 8 Wm D. Denard 8-11-04
SAFETY OFFICE-Bldg 400 N/A

BLUE STAKES Notification Required YES ___ NO V
Confirmation Number _____

(For excavations near natural gas lines call BLUE STAKES 2 days prior to the
excavation (801) 983-1555. This permit is not valid if yes is checked and
the confirmation number is missing.)

INSTALLATION SUPPORT DIV-Bldg 501 [Signature]

NOTE: THIS PERMIT IS TO BE COMPLETED AND ATTACHED TO THE WORK ORDER PRIOR TO
THE WORK ORDER BEING ISSUED.

AFTER HOUR EMERGENCIES? CALL 833-2304 or 833-2015

EXCAVATOR MUST HAVE A VALID PERMIT IN POSSESSION BEFORE/DURING EXCAVATION

SMATE Form 2782-R (Rev) Feb 02
(Previous edition obsolete)

Call GSTek
(3201/3994) 24 hrs.
Before dig start

DIVISION OF WATER RIGHTS
REQUEST FOR NON-PRODUCTION WELL CONSTRUCTION
(for wells deeper than 30 feet)

Well Type (check one): Provisional () Monitor (X) Cathodic Protection () Heat Exchange ()

Applicants Name: TOOELE ARMY DEPOT

Mailing Address: SIOTE-EO-EO (BLDG 8)

TOOELE ARMY DEPOT

TOOELE, UTAH 84074

Contact Person: MR. LARRY McFARLAND

Phone: (435) 833-3504

Proposed Start Date: 08/02/04

Anticipated Completion Date: 12/31/04

Well Drillers License No: 215

Proposed No. of Wells: 10

PROPOSED LOCATION OF WELLS:

County: TOOELE

NO./SQ. DISTANCE (feet)	EAST/WEST DISTANCE (feet)	SECTION CORNER	SECTION	TOWNSHIP	RANGE	BASE	DIAMETER (inches)	DEPTH (feet)
N1000	W1300	W4	15	2S	1W	SL	2	100

Use back of form or additional paper if more room is needed

EXPLANATORY: REFER TO ACCOMPANYING TABLE FOR INFORMATION ON PROPOSED
WELLS.

Signature of Applicant

Date

7-14-04

FOR OFFICE USE ONLY

Date of Request: _____

Approval Date: _____

Approved by: _____

Provisional/Monitor Well No. _____

Water Right Number (if available): _____

LOCATION DATA FOR PROPOSED GROUNDWATER MONITORING WELLS
UTAH INDUSTRIAL DEPOT, TOOELE, UTAH

Well Identifier	-proposed well location-		-referenced section corner-		-well location relative to section corner-		Section Corner	Section	Township	Range	Base	Diameter (inches)	Depth (feet)
	State Plane (northing)	State Plane (easting)	State Plane (northing)	State Plane (easting)	North/South Distance (feet)	East/West Distance (feet)							
C-41	7364702	1407022	7365112	1409429	South 413	West 2406	NE	30	3S	4W	SL	4	390
C-42	7385715	1406276	7365067	1404092	North 649	East 2187	SW	19	3S	4W	SL	4	355
C-43	7367012	1405964	7365067	1404092	North 1946	East 1863	SW	19	3S	4W	SL	4	320
C-44	7367575	1404058	7365067	1404092	North 2507	West 34	SE	24	3S	5W	SL	4	290
C-45	7370246	1405151	7370371	1404071	South 125	East 1076	NW	19	3S	4W	SL	4	310
C-46	7370246	1405151	7370371	1404071	South 125	East 1076	NW	19	3S	4W	SL	4	550
D-12	7367916	1410001	7370415	1409392	South 1731	East 433	NE	19	3S	4W	SL	4	400
D-13	7371871	1410626	7370415	1409392	North 1456	East 1355	SW	17	3S	4W	SL	4	355
D-14	7374293	1403758	7375579	1404047	South 817	West 256	NE	13	3S	5W	SL	4	240
D-16	7377309	1409136	7375667	1409370	North 1644	West 234	SE	7	3S	4W	SL	4	250



OLENE S. WALKER
Governor
GAYLE F. MCKEACHNIE
Lieutenant Governor

State of Utah

DEPARTMENT OF NATURAL RESOURCES

Division of Water Rights

ROBERT L. MORGAN
Executive Director

JERRY D. OLDS
State Engineer/Division Director

July 28, 2004

TOOELE ARMY DEPOT
SIOTE-EO-EO (BLDG 8)
TOOELE ARMY DEPOT
TOOELE, UT 84074

Dear Applicant:

RE: MONITOR WELL#: 0415004M00

Reference is made to your request to drill 10 MONITOR WELL(S). The anticipated drilling depths will exceed the minimum regulated and reporting depth of 30 feet, thereby requiring permission from the Division of Water Rights to proceed with this project.

The specifications outlined in your well project request dated July 28, 2004, meet the State Engineer's requirements and permission is **HEREBY GRANTED**. Therefore, this letter is your authorization to proceed with the construction of the well(s) in accordance with those specifications and with respect to the following provisions:

- 1) Small diameter casing is to be used in the construction of the well(s) and no more water is to be diverted than is necessary to determine the quality of the ground water by obtaining representative samples as required by the project.
- 2) The well(s) must be drilled by a currently licensed Utah driller and must be drilled in a manner consistent with the recommended construction standards cited in the Utah State Administrative Rules for Well Drillers.
- 3) The enclosed Driller (START) Card form must be given to the licensed driller for his submittal prior to commencing well construction. The other enclosed form is the 'Applicant Card.' It is **YOUR RESPONSIBILITY** to sign and return this Applicant Card form to our office upon well completion.
- 4) If complete information is not available in the initial application, it is the **APPLICANT'S RESPONSIBILITY** to provide, upon completion, descriptive locations of the wells referenced by course and distance from established section corners, e.g. North 565 feet and West 1096 feet from the SE corner of Section 35, T2S, R5W, SLB&M.
- 5) At such time as the well(s) are no longer utilized to monitor ground water and the intent of the project is terminated, the well(s) must be temporarily or permanently abandoned in a manner consistent with the Administrative Rules.

NOTE: Please be aware that your permission to proceed with the drilling under this authorization expires January 28, 2005.

Sincerely,

John Mann, P.E.
John Mann, P.E.
Regional Engineer

1394 West North Temple, Suite 220, PO Box 146300, Salt Lake City, UT 84114-6300
telephone (801) 538-7240 • facsimile (801) 538-7467 • www.waterrights.utah.gov

Utah!
Where ideas connect™

APPLICANT CARD for Monitor WELL#: 0415004M00

IMPORTANT: THIS CARD MUST BE COMPLETED, SIGNED AND RETURNED BY THE WELL
OWNER/APPLICANT AS SOON AS THE WELL IS DRILLED BY A LICENSED UTAH WATER
WELL DRILLER.

OWNER/APPLICANT NAME: TOOELE ARMY DEPOT

MAILING ADDRESS: SIOTE-EO-EO (BLDG 8), TOOELE ARMY DEPOT, TOOELE, UT 84074

PHONE NUMBER: 435-833-3504

WELL LOCATION: You are authorized to drill 10 Monitor Wells. SEE BELOW.

WELL UTM COORDINATES:

WELL ACTIVITY: NEW ☒ REPAIR () REPLACE () ABANDON ()
CLEAN () DEEPEN ()

WELL COMPLETION DATE:

NAME OF DRILLING COMPANY/LICENSEE:

Owner/Applicant Signature

Date

***COMPLETE. SIGN AND RETURN THIS PORTION UPON FINAL WELL COMPLETION -
DO NOT GIVE THIS CARD TO LICENSED WELL DRILLER - YOU MUST RETURN IT.

STATE OF UTAH DIVISION OF WATER RIGHTS Phone No. 801-538-7416

Fax No. 801-538-7467

COMMENTS:

MONITOR WELL LOCATIONS:

- (1) N 1644 W 234 from the SE corner, S07 T 3S R 4W SLBM
- (2) N 1456 E 1355 from the SW corner, S17 T 3S R 4W SLBM
- (3) N 649 E 2187 from the SW corner, S19 T 3S R 4W SLBM
- (4) N 1946 E 1863 from the SW corner, S19 T 3S R 4W SLBM
- (5) S 1731 E 433 from the NE corner, S19 T 3S R 4W SLBM
- (6) S 125 E 1076 from the NW corner, S19 T 3S R 4W SLBM
- (7) S 125 E 1076 from the NW corner, S19 T 3S R 4W SLBM
- (8) S 413 W 2406 from the NE corner, S30 T 3S R 4W SLBM
- (9) S 817 W 256 from the NE corner, S13 T 3S R 5W SLBM
- (10) N 2507 W 34 from the SE corner, S24 T 3S R 5W SLBM

AUG-

DRILLER (START) CARD for Monitor WELL#: 0415004M00

IMPORTANT: THIS CARD MUST BE RECEIVED BY THE DIVISION OF WATER RIGHTS PRIOR TO
THE BEGINNING OF WELL CONSTRUCTION -- REQUIRED ONLY FOR WELLS DEEPER THAN 30 FT.
OWNER/APPLICANT NAME: TOOELE ARMY DEPOT
MAILING ADDRESS: SIOTE-EO-EO (BLDG 8), TOOELE ARMY DEPOT, TOOELE, UT 84074
PHONE NUMBER: 435-833-3504
WELL LOCATION: You are authorized to drill 10 Monitor Wells. SEE BELOW.
WELL UTM COORDINATES:
WELL ACTIVITY: NEW ☒ REPAIR () REPLACE () ABANDON ()
CLEAN () DEEPEN ()

PROPOSED START DATE: 9-1-04

PROJECTED COMPLETION DATE: 8-1-05

LICENSE #: 625 LICENSEE/COMPANY: Layne Christensen Co.
58 8-29-04

Licensee Signature

Date

NOTICE TO APPLICANT: THIS CARD IS TO BE GIVEN TO A LICENSED UTAH WATER WELL
DRILLER FOR HIS SUBMITTAL PRIOR TO WELL CONSTRUCTION.

STATE OF UTAH DIVISION OF WATER RIGHTS Phone No. 801-538-7416
Fax No. 801-538-7467

MONITOR WELL LOCATIONS:

- (1) N 1644 W 234 from the SE corner, S07 T 3S R 4W SLBM
- (2) N 1456 E 1355 from the SW corner, S17 T 3S R 4W SLBM
- (3) N 649 E 2187 from the SW corner, S19 T 3S R 4W SLBM
- (4) N 1946 E 1863 from the SW corner, S19 T 3S R 4W SLBM
- (5) S 1731 E 433 from the NE corner, S19 T 3S R 4W SLBM
- (6) S 125 E 1076 from the NW corner, S19 T 3S R 4W SLBM
- (7) S 125 E 1076 from the NW corner, S19 T 3S R 4W SLBM
- (8) S 413 W 2406 from the NE corner, S30 T 3S R 4W SLBM
- (9) S 817 W 256 from the NE corner, S13 T 3S R 5W SLBM
- (10) N 2507 W 34 from the SE corner, S24 T 3S R 5W SLBM

T-458 P. 10/22 F-299

WELL DRILLER'S REPORT

State of Utah

Division of Water Rights

For additional space, use "Additional Well Data Form" and attach.

Well Identification

Non-Production Well: 0415004M00

WIN: 30266

Owner

Note any changes

TOOELE ARMY DEPOT
SIOTE-EO-EO (BLDG 8)
TOOELE ARMY DEPOT
TOOELE, UT 84074

Contact Person/Engineer: Richard Jirik / Parsons

Well Location

Note any changes

S 413 W 2406 from the NE corner of section 30, Township 3S, Range 4W, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground elevation, local well #) C-41

Drillers Activity

Start Date: 09/01/04

Completion Date: 01/14/05

Check all that apply: ☒ New ☐ Repair ☐ Deepen ☐ Clean ☐ Replace ☐ Public Nature of Use: Monitor Well

If a replacement well, provide location of new well. N/A feet north/south and N/A feet east/west of the existing well.

DEPTH (feet) FROM TO		BOREHOLE DIAMETER (in)	DRILLING METHOD	DRILLING FLUID
0	375	9	Percussion Hammer	N/A

Well Log

[illegible]

Static Water Level

Date 11/02/04 Water Level 348 feet Flowing? ☐ Yes ☒ No

Method of Water Level Measurement WLI If Flowing, Capped Pressure N/A PSI

Point to Which Water Level Measurement was Referenced	Ground Level Elevation	N/A
---	------------------------	-----

Height of Water Level reference point above ground surface N/A feet Temperature N/A degrees ☐ C ☐ F

Well Log

Construction Information

DEPTH (feet)		CASING			DEPTH (feet)		SCREEN <input checked="" type="checkbox"/> PERFORATIONS <input type="checkbox"/> OPEN BOTTOM		
FROM	TO	CASING TYPE AND MATERIAL/GRADE	WALL THICK (in)	NOMINAL DIAM. (in)	FROM	TO	SCREEN SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per round/interval)
0	355	4" Sch. 40 PVC	40	4	355	375	.010	4	Factory Sl

Well Head Configuration: Above GradeAccess Port Provided? ☒ Yes ☐ NoCasing Joint Type: Flush ThreadPerforator Used: N/AWas a Surface Seal Installed? ☒ Yes ☐ NoDepth of Surface Seal: 350 feetDrive Shoe? ☒ Yes ☐ NoSurface Seal Material Placement Method: Tremie Bentonite Pellets and Bentonite Grout

DEPTH (feet)		SURFACE SEAL / INTERVAL SEAL / FILTER PACK / PACKER INFORMATION		
FROM	TO	SEAL MATERIAL, FILTER PACK and PACKER TYPE and DESCRIPTION	Quantity of Material Used (if applicable)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)
0	343	Bentonite Grout	125 Bags	50 lbs each
343	350	Bentonite Pellets	4 Buckets	50 lbs each
350	374	16-40 Silica Sand	20 Bags	50 lbs each

Well Development and Well Yield Test Information

DATE	METHOD	YIELD	Units Check One		DRAWDOWN (ft)	TIME PUMPED (hrs & min)
			GPM	CFS		
	N/A					

Pump (Permanent)

Pump Description: N/A

Horsepower: _____ Pump Intake Depth: _____ feet

Approximate Maximum Pumping Rate: _____

Well Disinfected upon Completion? ☐ Yes ☐ No

Comments

Description of construction activity, additional materials used, problems encountered, extraordinary Circumstances, abandonment procedures. Use additional well data form for more space.

Well Driller Statement

This well was drilled and constructed under my supervision, according to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief.

Name LAYNE CHRISTENSEN COMPANYLicense No. 626

Signature _____

Date February 4, 2005

(Licensed Well Driller)

APPENDIX B

Friday 10/29/04

weather: overcast (~25°)

10 mph breeze to N

- 7:26 Crew outside fueling compressor and rig
I do rig inspection
- 7:50 Tailgate H&S
- 8:21 Begin Drilling @ 8-21-41 230' bgs
- 8:59 240' bgs - cemented matrix has slowed drilling way down
- 9:36 250' bgs - have used all rods on rod truck. Crew changes to 2nd rod truck. Need to jump start 2nd truck
- 10:03 Carl Cole stops by
- 10:06 260' bgs
- 11:05 I call Richard Junk w/ update
- 11:43 @ 298' fuel line cracks - crew repairs
- 12:15 Drilling again
- 13:50 Richard calls and has me run to the 90-Day yard to meet Gary from U.S. container who is dropping off 10-55 gallon drums in the yard. Gary has me sign Bill of Lading # 60918
- 14:15 @ 345' bgs crew has to clean cyclone
- 14:30 @ 350 rocks coming out of cyclone appear slightly damp and we expect groundwater near this depth so we shut down and set up secondary containment tank drums and drum truck
- 15:00 Crew decides to save the remaining footage for Monday. I call Carl Cole with this info. I go to Building 614 to log boring make copies and file paperwork
- 16:55 I leave site for Kleinfelder office

Pat [unclear] 10/29/04

Monday November 1, 2004

weather clear (2020°)

no wind

- 7:20 I arrive at C-41. Tom is outside pumping diesel into the compressor. He is then going to town for another load for the rig. I go to building 614
- 7:35 Jeff Bigelow is at 614. Kurt Alloway arrives behind me. I give Kurt all form originals from last week. I give Jeff the key/lock box. He is developing D-16 today. I grab PID and head back to C-41
- 7:50 I do rig inspection of drum truck - we will now haul the drums to the 90-Day ourselves as we don't have to drive on county/state highway.
- 8:05 I calibrate P.I.D. 96.7 on 100.0 ppm isobutylene
- 8:20 Crew arrives with well materials and drum truck. We label 7 drums
- 8:40 Tom moves head and takes a water level 334 ft bgs so we will target 375' bgs as the hole bottom. We have H&S target C
- 9:15 Carl Cole onsite. We call Ed Stays to clarify well screen interval. SOP states in an source area (source region) the screen should be 20 ft below water other wise 40'. Ed says this well is outside source region so we will drill to 375
- 9:22 Begin drilling at 350'
- 9:55 @ 355 Cemented zone is making for slow drilling which makes for over production of water in drums 4 drum to this point
- 10:45 Frame around hammer cracks. Crew calls a welder. Tom & Nate go paint D-13. Dave preps rig for welding
- 12:15 D-13 painted. Nate and I go unload 9 drums at 90-Day yard. PARS N20430501 thru 09
- 13:30 Rig is fixed and we begin drilling @ 358

11/1/04 (cont)

- 13:50 13:50 Tom feels the bit is plugged. Crew repairs
sounder to check inner barrel. They are only
able to get within 3 feet of bit. Tom tries
drilling again.
- 14:30 14 is evident that something has short circuited
the system so that air running down the outside
of the steel wall is not reaching the bit and
cannot carry cuttings to the surface. Some water
is coming up however so the problem is likely
near the end of the drill string. The only
option is to trip casing out of hole and look
at it.
- 14:40 Crew begins pulling out
- 17:05 All pipe out of hole. The inner barrel on the last
16 foot section (attached to bit) was collapsed and has
a hole in it. Tom says due to the wear from the rock
the side walls get thinner and thinner and eventually
fail. We will drill back in tomorrow.
- 17:20 All hands offsite. I call Richard with update

~~Walt Law~~ 11/1/04

11/2/04 Tuesday

weather = clear (w 90°)
no winds

- 9:50 I arrive at C-41. Richard Jurik and Kurt Mooney are outside talking to Tom and examining failed inner barrel. Crew is 90 feet in hole.
- 10:10 Richard & Kurt go to escort Baker Tank to the 90-Day yard.
- 10:20 Carl Cole outside. He and I go look at stakes location for C-42. Jeff said to move it if necessary for practice drill set up. We move stake 15' west & 15' north.
- 10:50 Crew has 200 ft into ground. I run to Building 614 for cooler and ice.
- 12:10 Back at C-41. Richard is outside. Crew has hit 300 feet and can no longer push rods in as hole has likely caved to this point. They remove secondary containment tank and will spread cuttings on ground until saturated zone is reached @ 334' bgs. I do rig inspection while drilling.
- 12:30 Crew has drilled to 330 and fuel line is broken at the injector. Crew repairs and changes exhaust filter.
- 12:35 We have H&S tailgate.
- 12:48 Begin drilling.
- 12:55 @ 334 we set up secondary containment to collect cuttings. I calibrate PID. 97.6ppm on 100ppm isobutylene.
- 13:20 Larry McFarlane and Dean Reynolds outside to pick up keys for locked drums in 90 Day yard. Jeff is pumping water from.
- 13:30 Crew has reach hole bottom at 358.
- 14:22 375' bgs. This is desired depth. We generated an additional 12 drums of Haz Waste (PARSN20430601 thru 12). The last 2 drums are not soil and water but just water pumped from the secondary containment tank. These 2 will be locked and left outside because the drum truck that we will leave in the 90-day

11/2/04 (cont)

Yard tonight is full I run to 90-Day yard to get trash pump and hoses. Carl will stay on site while crew gears up to construct well casing

14:50 Crew has begun construction by threading together 2-10' lengths of schedule 40 pvc, 0.010 slot, 4" diameter well screen. A 6" well bottom cap is also included

15:30 Crew has lowered the 20' of screen, 6" cap and 360 feet of schedule 40-4" blank casing down hole. touched bottom and then raised well off bottom about 1 foot so well is in suspension while adding sand pack. Top of casing is now 6'4" above ground surface so bottom of well is $380'6" - 6'4" = 374'2"$ bgs. Crew now begins pouring 50 lb bags of 16-40 Colorado Silica into annulus between well casing and inside wall of inner barrel. As previously calculated (p. 48) the volume of space of the annulus of a 9" borehole with a 4" well inside is 0.35 ft^3 per linear foot of borehole so after adding sand we will check quantities

16:55 Crew has added 20 bags of sand which has brought top of sand to 349.8 feet bgs. $375' - 349.8' = 25.2$ feet of annulus

$$25.2 \times 0.35 \text{ ft}^3 = 8.82 \text{ ft}^3$$

The manufacturer says each bag equals 0.5 ft^3 so $8.82 \text{ ft}^3 / 0.5 \text{ ft}^3/\text{bag} = 17.6$ bags

Crew has pulled 25 feet of run out of hole. We will leave things like this overnight

17:00 Crew takes drum truck to 90-Day yard while I lock drums 11 and 12

17:50 All hands off site

~~Watt/aur~~

Wednesday 11/3/04

weather: clear (~40°) no wind

- 7:30 I arrive at site. Crew is fueling rig. I run to building 614.
- 7:55 Back at site. Carl Cole onsite. Crew is preparing to place bentonite seal. They are using 5 gallon (50lb) buckets of cetco coated bentonite pellets. The manufacture claims 28.25 lbs of pellets will fill 1 linear foot of annulus with this volume (0.35 ft^3). I do my inspection.
- 9:10 Crew added pellets very slowly to avoid bridging inside casing. 4 buckets have brought top of seal to 340.9 feet, $(200 \text{ lbs} / 28.25 \text{ lbs/ft} = 7.07 \text{ ft})$
 $349.8 - 7 = 342.8$ so a small amount of casing occurred.)
- 9:20 We take a water level. 335.2 ft/lbs so the seal is completely under water so no need to hydrate. I try to contact TEAD utility to get water from well #3 but get no response. I call Larry McFarlane to get help but he has the day off. I call Carl Cole. He will drive down to Utility and try to scare someone up. We drive to 90-Day yard and hook up Decon trailer to bring back to C-41.
- 9:40 Carl calls. He has arranged to have someone at WW3 in 20 minutes. I run to town for fuel for steam cleaner.
- 10:10 Back at C-41, Tom is onsite with steam cleaner and sets up to slurry well.
- 10:25 Nate & Dave back with both water trucks. We have H & S tailgate and I provide quality dust masks as the grout mixing process is very dusty.
- 10:40 Crew begins mixing grout in batches and pumping them down inner casing.
- 1 batch = 2-50lb bags pure gals powdered benton
 + 28 gallon water
 = MOD with 30% solids weighing 10-10.2 lb/gallon
 = $4.4 \text{ ft}^3 = 12.57 \text{ linear ft of annulus (for 9" hole w/4" well)}$

11/3/04 (cont)

$\therefore 340.9 \text{ ft} / 12.57 \text{ ft/batch} = 27.1 \text{ batches or } 54 \text{ bags}$
of grout should fill borehole. Typically a good deal more is necessary due to the porosity of the formation

12:30 Jeff Bigelow onsite to collect IRW samples from the saturated zone of the borehole

14:00 Carl Cole onsite. He is wondering how we can secure wellhead overnight. I speak with Tom and he reminds me that he must keep well under tension overnight so it stays straight as slurry hardens. This involves keeping the lifting cap with tensioned cable attached to top of casing so it would be very difficult to tamper with and if someone DID (i.e. cut cable) we would know this in the morning.

15:12 Last rod out of hole. Crew will mix slurry to bring grout to surface tomorrow because they have no more grout onsite. They have used 109 bags so far

15:30 I go back to 614 to make copies of field forms

15:45 Back to C-41

16:00 offsite

~~mtf (un)~~

Thursday 11/4/04

weather: partly cloudy
(50°) no wind

- 7:15 I arrive @ C-41. Dave is onsite preparing to mix additional grout slurry to top off well annulus. He says Tom and Nate are at the 90-Day yard
- 7:30 At building 614 I meet Jeff Bigelow, Greg Calvert and Kurt Alloway. We are going to air sample VSG 4 located on the north side of building 615. We mob to Well
- 7:45 @ 615 we realize we have no way to measure flow, and therefore purge volumes at the well and so that we can repeat this process later at other wells I will go to the Klenfelter office and procure sample pumps with rotameters and a calibrator
- 9:05 I arrive at KA and Jim Blankenshaw runs me thru the calibration procedure & sets me up with a pump or two (five)
- 10:03 Back at site, Parsons personnel are all in a kickoff meeting for the sonic drill crew. I go to VSG 4 and get set up
- 10:35 I have elected to use an SKC Aircheck Sampler pump (Model 224 pxxs) but also have Gilman HFS 513A High Flow Sampler for backup. Samples are collected using a vacuum box and Tedlar bags.
- 10:40 Tom calls and needs a vine from 90-Day back to C-41. They are decomming rig and pipe trucks. A separate Baker tank has been provided for wells where the groundwater plumed (as C-41 is) and I label the tank for Haswaste (PARSN 230701).
- 11:30 Back at VSG 4, Jeff, Kurt & Greg and Richard Jovic are onsite to observe the process. I obtain original volume calculations from page 38 of a fieldnote book dated 5/5/99 use Durru

11/4/04 (cont)

original VSG 1 & 2 sampling.
 "Purge Volume Calculation"

1 purge volume = $\pi R^2 \times \text{length of tubing}$

Tube is 3/16" Diameter \therefore Radius = 0.09375 inches

$$V = 3.14 \times (0.09375 \text{ in})^2 \times \text{length of tube (ft)} \times 12 \text{ in/ft} \times 1 \text{ liter} / 61.02 \text{ in.}$$

$$= (0.005424 \text{ liter/ft}) (\text{length of tube})$$

Three volumes therefore

$$3V = (0.01632 \text{ liter/ft}) (\text{length of tube})$$

Purge time for 3 volumes @ 1 liter/min

$$= (0.01632 \text{ liter/ft}) (\text{length of tube}) (1 \text{ minute} / 1 \text{ liter})$$

$$= (0.01632 \text{ liter/ft}) (\text{length of tube})$$

so for

VSG 4

41 ft	= 0.7 min
72	1.2
103	1.7
134	2.2
165	2.7
196	3.2
227	3.7
258	4.2
289	4.7
320	5.2

11:50 Begin sampling VSG 4. Larry McEntee & Carl Cole visit site.

14:00 VSG sampling complete - see sample log for detail

I return samples to lab w. 614

Ed Stays is interested in collecting 2 samples from 103 feet on longer purge times for background info. Greg and I collect one sample at 10 minute purge and another at 20 minute purge. These are not run thru normal COC plan but just as extra info. Sample IDs 103-10x and 103-20x

15:10 I go to 90-Day yard to check on Decon crew has left for day. I call Tom to get his plan

16:00 I go to 614 to make copies and field Activity Report

16:30 off site

~~20/11/04~~ 11/4/04

Friday 11/5/04

weather: offsite

- 8:00 I am in the office today working on C-41 log and completion rps
- 8:15 Tom calls to tell me they intend to do surface completion at C-41, paint C-41 and D-16 and move rig to C-42 so that we may be ready to drill Monday morning. He needs a well key to drill well holes in D-16 & C-41. I will contact Carl Cole about this.
- 9:50 Richard Jurik call to find out what is happening on my end
- 11:40 Kurt Alloway calls to say he had to cut well lock off USG-7 as he has no key. I explain Carl Cole has key and I will provide him with mine for his next well on Monday
- 13:20 Jeff Bigelow calls asking if they can use my PID for sonic rig. I explain it is in Building 614 and may need charging
- 14:20 I speak with Tom Kern. He will be leaving site soon and I will meet him at Laysan shop to go over Daily Drill Reports
- 15:30 I meet Tom Kern @ Laysan
- 16:10 Return to KA office to work on well construction diagrams and do time cards, expense rpt, etc.
- 17:10 Leave office for home

Walt

11/5/04

FIELD ACTIVITY REPORT

Project Number/WBS: <u>744139/20010</u>		Date: <u>10/28/04</u>			
SWMU: <u>58</u>		Arrival Time: <u>7:25</u>			
Team Leader: <u>Richard Jurik</u>		Departure Time / Destination: <u>18:10</u>			
Team Members: <u>Jeff Bigelow, Matt Ivans</u>		Weather: <u>(~30°) overcast, some rain, 10-20 mph to NW</u>			
Purpose: (Attach all appropriate forms) <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Geophysical Survey <input type="checkbox"/> Soil Gas Survey <input type="checkbox"/> Hydropunch <input type="checkbox"/> Test Pit <input type="checkbox"/> GPS <input type="checkbox"/> CPT <input type="checkbox"/> Other (specify) _____ </td> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Well Installation <u>C-41</u> <input type="checkbox"/> Well Development _____ <input type="checkbox"/> Microwell Sampling <input type="checkbox"/> Monitor Well Sampling <input type="checkbox"/> Vertical Boring <input type="checkbox"/> Angle Boring <input type="checkbox"/> Hand Auger <input type="checkbox"/> Surface Soil Sampling </td> </tr> </table>				<input type="checkbox"/> Geophysical Survey <input type="checkbox"/> Soil Gas Survey <input type="checkbox"/> Hydropunch <input type="checkbox"/> Test Pit <input type="checkbox"/> GPS <input type="checkbox"/> CPT <input type="checkbox"/> Other (specify) _____	<input checked="" type="checkbox"/> Well Installation <u>C-41</u> <input type="checkbox"/> Well Development _____ <input type="checkbox"/> Microwell Sampling <input type="checkbox"/> Monitor Well Sampling <input type="checkbox"/> Vertical Boring <input type="checkbox"/> Angle Boring <input type="checkbox"/> Hand Auger <input type="checkbox"/> Surface Soil Sampling
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Protection Level: <input type="checkbox"/> D <input type="checkbox"/> C <input type="checkbox"/> B <input type="checkbox"/> A					
Health and Safety Briefing: Time <u>8:04</u> People Present <u>TK, DK, NS, MI</u> Topics Discussed: <u>Respiratory Hazard</u>					
Logbook Book # <u>B071503</u> Page # <u>66</u>		M/C Parties <input type="checkbox"/> TEU Response <input type="checkbox"/> Lockheed Monitoring Notified <input type="checkbox"/> Range Control/Security (460) <input type="checkbox"/> Pillbox Support <input type="checkbox"/> Meteorology			
Photos Camera # _____ Roll # _____ Frame # _____					
IDW Drums: Purge / Rinse / Soil / Other #ES(s) _____ Closed?: Y / N Current Location: _____ Update DITF?: Y / N					
Notes: <u>7:25 Arrive at C-41 7:40 Rig inspection 8:04 H's S</u> <u>tailgate 8:29 Begin drilling 12:04 @ 130' bgs dismantle &</u> <u>clean cyclone 13:40 Carl Cole onsite 15:30 Dow Yea onsite</u> <u>16:48 @ 230 lightning shot down 17:02 Crew offsite 18:10 offsite</u>					

FIELD ACTIVITY REPORT

Project Number/WBS: <u>744139/20010</u>		Date: <u>10/29/04</u>			
SWMU: <u>58</u>		Arrival Time: <u>7:26</u>			
Team Leader: <u>Richard Jurik</u>		Departure Time \ Destination: _____			
Team Members: <u>Matt Ivers Jeff Bigelow</u>		Weather: <u>overcast (25°) 10 mph to N</u>			
Purpose: (Attach all appropriate forms) <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Geophysical Survey <input type="checkbox"/> Soil Gas Survey <input type="checkbox"/> Hydropunch <input type="checkbox"/> Test Pit <input type="checkbox"/> GPS <input type="checkbox"/> CPT <input type="checkbox"/> Other (specify) _____ </td> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Well Installation <u>C-41</u> <input type="checkbox"/> Well Development _____ <input type="checkbox"/> Microwell Sampling <input type="checkbox"/> Monitor Well Sampling <input type="checkbox"/> Vertical Boring <input type="checkbox"/> Angle Boring <input type="checkbox"/> Hand Auger <input type="checkbox"/> Surface Soil Sampling </td> </tr> </table>				<input type="checkbox"/> Geophysical Survey <input type="checkbox"/> Soil Gas Survey <input type="checkbox"/> Hydropunch <input type="checkbox"/> Test Pit <input type="checkbox"/> GPS <input type="checkbox"/> CPT <input type="checkbox"/> Other (specify) _____	<input checked="" type="checkbox"/> Well Installation <u>C-41</u> <input type="checkbox"/> Well Development _____ <input type="checkbox"/> Microwell Sampling <input type="checkbox"/> Monitor Well Sampling <input type="checkbox"/> Vertical Boring <input type="checkbox"/> Angle Boring <input type="checkbox"/> Hand Auger <input type="checkbox"/> Surface Soil Sampling
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Protection Level: <input checked="" type="checkbox"/> D <input type="checkbox"/> C <input type="checkbox"/> B <input type="checkbox"/> A					
Health and Safety Briefing: Time <u>7:50</u> People Present <u>TK, DK, NS, MI</u>					
Topics Discussed: <u>Lightning Hazards</u>					
Logbook Book # <u>B071503</u> Page # <u>67</u>		M/C Parties <input type="checkbox"/> TEU Response <input type="checkbox"/> Lockheed Monitoring Notified <input type="checkbox"/> Range Control/Security (460) <input type="checkbox"/> Pillbox Support <input type="checkbox"/> Meteorology			
Photos Camera # _____ Roll # _____ Frame # _____					
IDW Drums: Purge / Rinse / Soil / Other #ES(s) _____					
Closed?: Y / N		Current Location: _____ Update DITF?: Y / N			
Notes: <u>7:26</u> Outside Do viz inspection <u>7:50</u> Tailgate <u>H&S</u> <u>8:21</u> Begin drilling @ 230' bgs <u>11:43</u> Fuel line cracks <u>12:15</u> Drilling again <u>13:50</u> Meet US container @ 90 day yard <u>14:15</u> @ 345 crew cleans cyclone <u>14:30</u> @ 380 cuttings damp. Shut down. Set up secondary containment. <u>15:00</u> Crew leaves site <u>16:55</u> I leave building 614					

FIELD ACTIVITY REPORT

Project Number/WBS: <u>744139/20010</u>		Date: <u>11/1/04</u>			
SWMU: <u>58</u>		Arrival Time: <u>7:20</u>			
Team Leader: <u>Richard Turk</u>		Departure Time / Destination: <u>17:20</u>			
Team Members: <u>Jeff Bigelow, Matt Wiers</u>		Weather: <u>Clear (~20°) no wind</u>			
Purpose: (Attach all appropriate forms) <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Geophysical Survey <input type="checkbox"/> Soil Gas Survey <input type="checkbox"/> Hydropunch <input type="checkbox"/> Test Pit <input type="checkbox"/> GPS <input type="checkbox"/> CPT <input type="checkbox"/> Other (specify) _____ </td> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Well Installation <u>C-41</u> <input type="checkbox"/> Well Development _____ <input type="checkbox"/> Microwell Sampling <input type="checkbox"/> Monitor Well Sampling <input type="checkbox"/> Vertical Boring <input type="checkbox"/> Angle Boring <input type="checkbox"/> Hand Auger <input type="checkbox"/> Surface Soil Sampling </td> </tr> </table>				<input type="checkbox"/> Geophysical Survey <input type="checkbox"/> Soil Gas Survey <input type="checkbox"/> Hydropunch <input type="checkbox"/> Test Pit <input type="checkbox"/> GPS <input type="checkbox"/> CPT <input type="checkbox"/> Other (specify) _____	<input checked="" type="checkbox"/> Well Installation <u>C-41</u> <input type="checkbox"/> Well Development _____ <input type="checkbox"/> Microwell Sampling <input type="checkbox"/> Monitor Well Sampling <input type="checkbox"/> Vertical Boring <input type="checkbox"/> Angle Boring <input type="checkbox"/> Hand Auger <input type="checkbox"/> Surface Soil Sampling
<input type="checkbox"/> Geophysical Survey <input type="checkbox"/> Soil Gas Survey <input type="checkbox"/> Hydropunch <input type="checkbox"/> Test Pit <input type="checkbox"/> GPS <input type="checkbox"/> CPT <input type="checkbox"/> Other (specify) _____	<input checked="" type="checkbox"/> Well Installation <u>C-41</u> <input type="checkbox"/> Well Development _____ <input type="checkbox"/> Microwell Sampling <input type="checkbox"/> Monitor Well Sampling <input type="checkbox"/> Vertical Boring <input type="checkbox"/> Angle Boring <input type="checkbox"/> Hand Auger <input type="checkbox"/> Surface Soil Sampling				
Protection Level: <input checked="" type="checkbox"/> D <input type="checkbox"/> C <input type="checkbox"/> B <input type="checkbox"/> A					
Health and Safety Briefing: Time <u>8:40</u> People Present <u>TK, DK, NS, WI</u> Topics Discussed: <u>Exhaust Gas hazards</u>					
Logbook Book # <u>B041503</u> Page # <u>68, 69</u>		M/C Parties <input type="checkbox"/> TEU Response <input type="checkbox"/> Lockheed Monitoring Notified <input type="checkbox"/> Range Control/Security (460) <input type="checkbox"/> Pillbox Support <input type="checkbox"/> Meteorology			
Photos Camera # _____ Roll # _____ Frame # _____					
IDW Drums: Purge / Rinse / Soil / Other #ES(s) _____ Closed?: Y / N Current Location: _____ Update DITF?: Y / N					
Notes: <u>7:20 Arrive at C-41. Crew fueling rig & compressor. Go to 614</u> <u>7:35 Bigelow & Kurt Albury at 614 7:50 Back at C-41 to rig inspection</u> <u>8:05 Calibrate PID 8:20 Label Haz Waste drums. 8:40 Take W.L. = 334' bgs</u> <u>Have H&S taggate. 9:22 Begin drilling @ 350 10:45 Frame around</u> <u>hammer cracks - call for welder 12:15 D-13 is painted red 13:30 Rig</u> <u>repaired, begin drilling @ 358 13:50 lost circulation to hole bottom</u> <u>with air. Sound bottom. Can't get to bit. 14:40 Begin tripping out</u> <u>17:05 Pipe out of hole. Inner barrel collapse just above bit</u> <u>17:20 All hammers off site</u>					

FIELD ACTIVITY REPORT

Project Number/WBS: <u>744139/20010</u>		Date: <u>11/2/04</u>	
SWMU: <u>58</u>		Arrival Time: <u>9:50</u>	
Team Leader: <u>Richard Junk</u>		Departure Time / Destination: <u>17:50</u>	
Team Members: <u>Jeff Bigelow, Matt Ivers</u>		Weather: <u>clear (w40°) no wind</u>	

Purpose: (Attach all appropriate forms)	
<input type="checkbox"/> Geophysical Survey <input type="checkbox"/> Soil Gas Survey <input type="checkbox"/> Hydropunch <input type="checkbox"/> Test Pit <input type="checkbox"/> GPS <input type="checkbox"/> CPT <input type="checkbox"/> Other (specify) _____	<input checked="" type="checkbox"/> Well Installation <u>C-41</u> <input type="checkbox"/> Well Development _____ <input type="checkbox"/> Microwell Sampling <input type="checkbox"/> Monitor Well Sampling <input type="checkbox"/> Vertical Boring <input type="checkbox"/> Angle Boring <input type="checkbox"/> Hand Auger <input type="checkbox"/> Surface Soil Sampling

Protection Level: <input checked="" type="checkbox"/> D <input type="checkbox"/> C <input type="checkbox"/> B <input type="checkbox"/> A
Health and Safety Briefing: Time <u>12:35</u> People Present <u>DK, TK, NS, MI</u>
Topics Discussed: <u>Saturated soil hazards</u>

Logbook Book # <u>B071503</u> Page # <u>70, 71</u>	M/C Parties <input type="checkbox"/> TEU Response <input type="checkbox"/> Lockheed Monitoring Notified <input type="checkbox"/> Range Control/Security (460) <input type="checkbox"/> Pillbox Support <input type="checkbox"/> Meteorology
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Photos Camera # _____ Roll # _____ Frame # _____

IDW Drums: Purge / Rinse / Soil / Other #ES(s) _____
Closed?: Y / N Current Location: _____ Update DITF?: Y / N

Notes: 9:50 Arrive at site. Richard Junk / Kurt Alway outside. Crew
has drilled to 90'. Inspect collapsed inner barrel. 10:20 Go with
Carl Cole to move C-42 location 10:50 200' back in ground
12:10 300' in ground. Hole caved to here. Must begin hammering. Rig inspection
12:30 330' Fuel line replacement. 12:35 H's tailgate 12:48 Drilling 12:55
@ 334 begin containing cuttings - calibrate PID 13:30 Back to original hole
bottom @ 358 14:22 375' bgs - 9 drums of cuttings PARSU20430601 thru 10' and
2 drums of water from 2nd containment tank (12+11) 15:30 Casing lowered to
374.2". Screen 373'8" to 353'8" 16:55 20 bag sand from 375 to 349'8" 17:10 Take
Drum truck 9 10 Drums to 90-Day. 2 Drums locked onsite 17:50 off site

Project Number/WBS: 744139/20010

Date: 11/3/04

SWMU: 58

Arrival Time: 7:30

Team Leader: Richard Jurik

Departure Time \ Destination: 16:00

Team Members: Jeff Bygones, Matt Ivers

Weather: clear (~40°) no wind

Purpose: (Attach all appropriate forms)

- ☐ Geophysical Survey
☐ Soil Gas Survey
☐ Hydropunch
☐ Test Pit
☐ GPS
☐ CPT
☐ Other (specify) _____

- ☒ Well Installation C-41
☐ Well Development _____
☐ Microwell Sampling
☐ Monitor Well Sampling
☐ Vertical Boring
☐ Angle Boring
☐ Hand Auger
☐ Surface Soil Sampling

Protection Level: ☒ D ☐ C ☐ B ☐ A

Health and Safety Briefing: Time 10:15 People Present TK, DK, NS, MI

Topics Discussed: _____

Logbook Book # B071503

Page # 72

M/C Parties

☐ TEU Response ☐ Lockheed Monitoring

Notified

☐ Range Control/Security (460)

☐ Pillbox Support ☐ Meteorology

Photos

Camera # _____

Roll # _____

Frame # _____

IDW Drums: Purge / Rinse / Soil / Other #ES(s)

Closed?: Y / N

Current Location:

Update DITF?: Y / N

Notes: 7:30 Arrive at site Crew outside 7:40 @ Building 614
7:55 Back outside Do rig inspection 8:10 Crew places double
seal 9:10 4-50lb buckets placed Top of seal at 340.9' bgs 9:20
We take a water level = 335.2 Seal is saturated by Ground Water
10:10 Fill 2 trucks & Decov trailer with Water Well 3 water 10:25 H&S tailgate
10:40 Begin to Slurry well 12:30 Jeff Bygones outside for IDW samples
14:00 Call Cole outside briefly 15:12 Last rod out of borehole 15:30 Crew
out of ground at 109 bags 15:19 go to 614 to copy forms 16:00 off site

FIELD ACTIVITY REPORT

C-41

Project Number/WBS: 744139/2001D Date: 11/4/04

SWMU: 58 Arrival Time: 7:15

Team Leader: Richard Ivick Departure Time / Destination: _____
Greg Calvert, Kurt Alloway

Team Members: Jeff Bigelow, Matt Weng Weather: partly cloudy (50°) no wind

Purpose: (Attach all appropriate forms)

- ☐ Geophysical Survey
- ☐ Soil Gas Survey
- ☐ Hydropunch
- ☐ Test Pit
- ☐ GPS
- ☐ CPT
- ☐ Other (specify) _____

- ☒ Well Installation C-41
- ☐ Well Development _____
- ☐ Microwell Sampling
- ☐ Monitor Well Sampling
- ☐ Vertical Boring
- ☐ Angle Boring
- ☐ Hand Auger
- ☐ Surface Soil Sampling

Protection Level: ☒ D ☐ C ☐ B ☐ A

Health and Safety Briefing: Time _____ People Present _____

Topics Discussed: _____

Logbook Book # 3071503
 Page # 74, 75

M/C Parties ☐ TEU Response ☐ Lockheed Monitoring
 Notified ☐ Range Control/Security (460)
☐ Pillbox Support ☐ Meteorology

Photos Camera # _____ Roll # _____ Frame # _____

IDW Drums: Purge / Rinse / Soil / Other #ES(s)

Closed?: Y / N

Current Location:

Update DITF?: Y / N

Notes: 7:15 arrive at C-14 7:30 Arrive at 614. Meet Bigelow, Alloway and
Greg Calvert (Parsons) 7:45 Go to 615 to sample VSG-4 - need flow
meter for purge volume calcs. Go to Kleinfelder office to procure
9:05 At Kleinfelder 10:03 Back at site. Parsons in truck off for some
drilling 10:35 Set up to sample 10:40 Give Tom Kern rise from
90 day - They have slurries to surface; are decoupling. 1 table
Baker tank for C-41 decou/development water 11:30 Do volume calcs for VSG-4
11:56 Begin Sampling 14:00 Take 2 additional samples 15:10 To
90 Day to inspect 16:00 To 614 to copy 16:30 off site

FIELD ACTIVITY REPORT

C-41

Project Number/WBS: <u>744139/20010</u>		Date: <u>11-9-04</u>			
SWMU: <u>58/TEAD MW C-41</u>		Arrival Time: <u>08:00</u>			
Team Leader: <u>J. Byeler</u>		Departure Time \ Destination: <u>17:00</u>			
Team Members: <u>J. Henman, T. Fetzner</u>		Weather: <u>Rain, 50-60°F, 14mm</u>			
Purpose: (Attach all appropriate forms) <table style="width:100%; border: none;"> <tr> <td style="width:50%; vertical-align: top;"> <input type="checkbox"/> Geophysical Survey <input type="checkbox"/> Soil Gas Survey <input type="checkbox"/> Hydropunch <input type="checkbox"/> Test Pit <input type="checkbox"/> GPS <input type="checkbox"/> CPT <input type="checkbox"/> Other (specify) _____ </td> <td style="width:50%; vertical-align: top;"> <input type="checkbox"/> Well Installation <input checked="" type="checkbox"/> Well Development <u>C-41</u> <input type="checkbox"/> Microwell Sampling <input type="checkbox"/> Monitor Well Sampling <input type="checkbox"/> Vertical Boring <input type="checkbox"/> Angle Boring <input type="checkbox"/> Hand Auger <input type="checkbox"/> Surface Soil Sampling </td> </tr> </table>				<input type="checkbox"/> Geophysical Survey <input type="checkbox"/> Soil Gas Survey <input type="checkbox"/> Hydropunch <input type="checkbox"/> Test Pit <input type="checkbox"/> GPS <input type="checkbox"/> CPT <input type="checkbox"/> Other (specify) _____	<input type="checkbox"/> Well Installation <input checked="" type="checkbox"/> Well Development <u>C-41</u> <input type="checkbox"/> Microwell Sampling <input type="checkbox"/> Monitor Well Sampling <input type="checkbox"/> Vertical Boring <input type="checkbox"/> Angle Boring <input type="checkbox"/> Hand Auger <input type="checkbox"/> Surface Soil Sampling
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Protection Level: <input checked="" type="checkbox"/> D <input type="checkbox"/> C <input type="checkbox"/> B <input type="checkbox"/> A					
Health and Safety Briefing: Time <u>08:00</u> People Present <u>See above</u> Topics Discussed: <u>Wear PPE, slippery surfaces</u>					
Logbook Book # <u>1</u> Page # _____		M/C Parties <input type="checkbox"/> TEU Response <input type="checkbox"/> Lockheed Monitoring Notified <input type="checkbox"/> Range Control/Security (460) <input type="checkbox"/> Pillbox Support <input type="checkbox"/> Meteorology			
Photos Camera # _____ Roll # _____ Frame # _____					
IDW Drums: <u>Purge</u> / Rinse / Soil / Other #ES(s) <u>PARSN20430901</u> Closed?: <u>Y/N</u> Current Location: <u>U10 90 day yard</u> Update DITF?: <u>(Y)N</u>					
Notes: <u>08:00 H+S meeting 09:00 started purging</u> <u>10:30 Bailed 60 gallons + started purging well</u> <u>11:45 Bailed 90 gallons + purging well</u> <u>12:32 Bailed 105 gallons</u> <u>13:43 Started pumping</u> <u>17:00 Pumped 320 gallons, transferred water to</u> <u>U10 90-day yard</u>					

C-41

Project Number/WBS: 144139/20010 Date: 11-10-04

SWMU: S8/TEAD C-41 Arrival Time: 07:00

Team Leader: J. Bigelow Departure Time \ Destination: _____

Team Members: J. Henman, J. Fetzer Weather: partly 40-50°F, 11 wind

Purpose: (Attach all appropriate forms)

- ☐ Geophysical Survey
- ☐ Soil Gas Survey
- ☐ Hydropunch
- ☐ Test Pit
- ☐ GPS
- ☐ CPT
- ☐ Other (specify) _____

- ☐ Well Installation _____
- ☒ Well Development C-41
- ☐ Microwell Sampling
- ☐ Monitor Well Sampling
- ☐ Vertical Boring
- ☐ Angle Boring
- ☐ Hand Auger
- ☐ Surface Soil Sampling

Protection Level: ☒ D ☐ C ☐ B ☐ A

Health and Safety Briefing: Time _____ People Present _____

Topics Discussed: _____

Logbook Book # _____
Page # _____

M/C Parties ☐ TEU Response ☐ Lockheed Monitoring
Notified ☐ Range Control/Security (460)
☐ Pillbox Support ☐ Meteorology

Photos Camera # _____ Roll # _____ Frame # _____

IDW Drums Purge / Rinse / Soil / Other #ES(s) PARSN20430901

Closed?: Y/N Current Location: UIP 90 day yard Update DITF?: Y/N

Notes: 07:57 Start purging pumping well

08:14 Backflushed 5x

09:15 Pumped 500 gallons when parameters stabilized + complete development

500 + 105 gallons = 605 gallons purged

13:39 Transported water to Baker Tank at UIP 90-day yard and left site

HEALTH AND SAFETY BRIEFING

Date: 10 / 28 / 04

Time: 8:04

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

1. <i>[Signature]</i>	11.
2. <i>[Signature]</i>	12.
3. <i>[Signature]</i>	13.
4. <i>[Signature]</i>	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

AGENDA

1. We are now drilling in the soil above the groundwater
2. please so be particularly carefull not to whole cutting
3. dust and wear nitrite gloves once the saturation
4. zone is encountered OK
- 5.
- 6.
- 7.
- 8.
- 9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

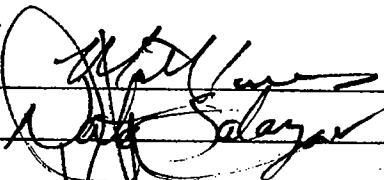

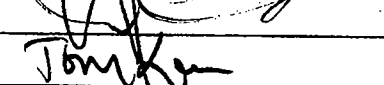
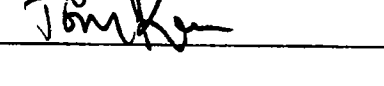
HEALTH AND SAFETY BRIEFING

Date: 10 / 29 / 04

Time: 7:50

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

1. 	11.
2. 	12.
3. 	13.
4. 	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

AGENDA

1. Yesterday we were shut down by lightning
2. at the end of the day. If you see the
3. flash and count slowly every 3 seconds indicates
4. one mile of distance from the rig. If lightning
5. is within one mile shut down until it passes
6. — or sooner if you feel it is wise
7. Always ~~wear~~ wear HARD HAT!
- 8.
- 9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

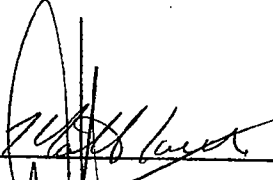
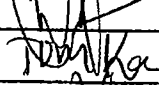
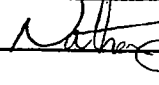
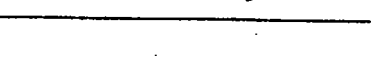
HEALTH AND SAFETY BRIEFING

Date: 11 / 1 / 04

Time: 8:40

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

1. 	11.
2. 	12.
3. 	13.
4. 	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

AGENDA

1. With the cold weather it takes longer to
2. warm up equipment in the morning and
3. the cold air makes exhaust sink and stay
4. closer to ground. AVOID working in exhaust
5. stream to lessen inhalation of dangerous
6. carbon monoxide and other toxic gases
- 7.
- 8.
- 9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

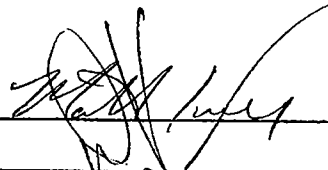

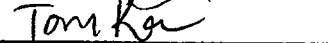
HEALTH AND SAFETY BRIEFING

Date: 11 / 2 / 04

Time: 12:35

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

1. 	11.
2.	12.
3. 	13.
4. 	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

AGENDA

1. In the saturated cuttings it is critical that
2. you wear nitrile gloves when handling cuttings
3. or water generated from borehole, that you don't
4. eat or drink in the exclusion zone and that
5. all water and soil generated is contained
- 6.
- 7.
- 8.
- 9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

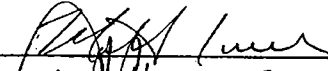
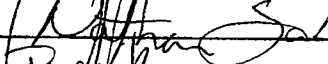
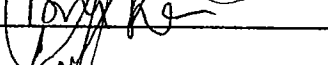
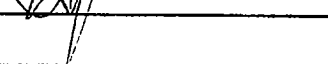
HEALTH AND SAFETY BRIEFING

Date: 11/3/04

Time: 10:15

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

1.		11.
2.		12.
3.		13.
4.		14.
5.		15.
6.		16.
7.		17.
8.		18.
9.		19.
10.		20.

AGENDA

1.	<u>Powered Benoxide is a respiratory hazard</u>
2.	<u>Use the masks provided to minimize health</u>
3.	<u>effects in your lungs</u>
4.	
5.	
6.	
7.	
8.	
9.	

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

HEALTH AND SAFETY BRIEFING

Date: 11, 9, 04

Time: 08:00

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

DEVELOPMENT
OF WELL C-41

1.	11.
2.	12.
3. <i>Jeffrey Hammer</i>	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

AGENDA

1. <i>Wear proper PPE (gloves, hard hat, etc.)</i>
2. <i>Careful of slippery surfaces</i>
3.
4.
5.
6.
7.
8.
9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

HEALTH AND SAFETY BRIEFING

Date: 11/05/04

Time: 07:15

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

WELL C-41

1. <u>[Signature]</u>	11.
2. <u>[Signature]</u>	12.
3. <u>[Signature]</u>	13.
4. <u>[Signature]</u>	14.
5. <u>[Signature]</u>	15.
6. <u>[Signature]</u>	16.
7. <u>[Signature]</u>	17.
8. <u>Richard Girik</u>	18.
9.	19.
10.	20.

AGENDA

1. <u>Careful w/ hazardous waste</u>
2. <u>watch for trucks + other vehicles on-site</u>
3.
4.
5.
6.
7.
8.
9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

Layne Christensen Company Job Site Safety

C-41

Date 10/28/04

Site: TEAD Phase II RFI

Client: USACE

Rig/Crew: Tom Kern, Nate Salazar, Dave Kyle

Observers: Matt Ivers

Crew Safety/PPE

YES NO N/A

YES NO N/A

Hard Hat

☒ ☐ ☐

Safety Glasses

☒ ☐ ☐

Lifting Belt

☒ ☐ ☐

Training Certificates

☐ ☐ ☒

Gloves

☒ ☐ ☐

Hearing Protection

☒ ☐ ☐

Safety Shoes

☒ ☐ ☐

Proper Clothing

☒ ☐ ☐

Layne Safety Practice Manual

☐ ☐ ☒

Dust masks/Level C respirators

☐ ☐ ☒DOT physical card, CDL and logbooks
present and up to date?☐ ☐ ☒Emergency numbers/HASP present
and posted?☒ ☐ ☐

Comments:

Have moved Deconved rig and started
Monitoring Well C-41 today

Site Set-up and Safety

Hole openings covered or tied off?

☐ ☐ ☒

Timbers and set-up jacks stable?

☒ ☐ ☐Anchor guy lines secure, evenly
tensioned and flagged?☐ ☐ ☒Mud or circulation pits barricaded
or fenced?☐ ☐ ☒Excavation permit (CA) and shoring
considerations?☐ ☐ ☒Traveling blocks, widow makers and
elevators inspected?☐ ☐ ☒

Site clean and organized? Footing?

☒ ☐ ☐

Bulk fuel stores lined and grounded?

☐ ☐ ☒

Pipe blocked and sloped from work area?

☒ ☐ ☐

Correct monitoring equipment present?

☒ ☐ ☐

Overhead and underground lines identified?

☒ ☐ ☐

Chemicals stored away from fuel and protected?

☐ ☐ ☒

Material Safety Data Sheets present?

☒ ☐ ☐

Warning signs/Exclusion zone posted?

☒ ☐ ☐

Comments:

Rig Safety

Kill switch operational?

☒ ☐ ☐

All mast wiring in conduits?

☒ ☐ ☐Vehicle pretrip inspection performed and
documented?☐ ☐ ☒Seat belts available and used on all
equipment?☒ ☐ ☐

Fire extinguisher present and charged?

☒ ☐ ☐

First aid/BBP kit present and stocked?

☒ ☐ ☐

Danger points color coded?

☐ ☐ ☒

Controls identified?

☒ ☐ ☐

Side guardrails on platform rigs?

☒ ☐ ☐

Ropes and chains in good condition?

☒ ☐ ☐

Belts and rotating shafts guarded?

☒ ☐ ☐

All hooks have safety latches?

☒ ☐ ☐

Cables in good shape, clamps installed properly?

☒ ☐ ☐

Pressure hoses safety chained at connections?

☒ ☐ ☐

Good housekeeping in vehicle cabs?

☒ ☐ ☐

Spill control materials present?

☒ ☐ ☐

Layne Christensen Company Job Site Safety

C-41

Date 10/29/04

Site: TEAD Phase II RFI

Client: USACE

Rig/Crew: Tom Kern Dave Kyle Nate Solares Matt Ivers

Observers: Matt Ivers

Crew Safety/PPE

YES NO N/A

YES NO N/A

Hard Hat

☒ ☐ ☐

Safety Glasses

☒ ☐ ☐

Lifting Belt

☒ ☐ ☐

Training Certificates

☐ ☐ ☒

Gloves

☒ ☐ ☐

Hearing Protection

☒ ☐ ☐

Safety Shoes

☒ ☐ ☐

Proper Clothing

☒ ☐ ☐

Layne Safety Practice Manual

☐ ☐ ☒

Dust masks/Level C respirators

☐ ☐ ☒DOT physical card, CDL and logbooks
present and up to date?☐ ☐ ☒Emergency numbers/HASP present
and posted?☒ ☐ ☐

Comments:

Fuel line on head replaced yesterday p.m. ✓

Site Set-up and Safety

Hole openings covered or tied off?

☐ ☐ ☒

Timbers and set-up jacks stable?

☒ ☐ ☐Anchor guy lines secure, evenly
tensioned and flagged?☐ ☐ ☒Mud or circulation pits barricaded
or fenced?☐ ☐ ☒Excavation permit (CA) and shoring
considerations?☐ ☐ ☒Traveling blocks, widow makers and
elevators inspected?☐ ☐ ☒

Site clean and organized? Footing?

☒ ☐ ☐

Bulk fuel stores lined and grounded?

☐ ☐ ☒

Pipe blocked and sloped from work area?

☒ ☐ ☐

Correct monitoring equipment present?

☒ ☐ ☐

Overhead and underground lines identified?

☒ ☐ ☐

Chemicals stored away from fuel and protected?

☒ ☐ ☒

Material Safety Data Sheets present?

☒ ☐ ☐

Warning signs/Exclusion zone posted?

☒ ☐ ☐

Comments:

Rig Safety

Kill switch operational?

☒ ☐ ☐

All mast wiring in conduits?

☒ ☐ ☐Vehicle pretrip inspection performed and
documented?☐ ☐ ☒Seat belts available and used on all
equipment?☒ ☐ ☐

Fire extinguisher present and charged?

☒ ☐ ☐

First aid/BBP kit present and stocked?

☒ ☐ ☐

Danger points color coded?

☐ ☐ ☒

Controls identified?

☒ ☐ ☐

Side guardrails on platform rigs?

☐ ☐ ☒

Ropes and chains in good condition?

☒ ☐ ☐

Belts and rotating shafts guarded?

☒ ☐ ☐

All hooks have safety latches?

☒ ☐ ☐

Cables in good shape, clamps installed properly?

☒ ☐ ☐

Pressure hoses safety chained at connections?

☒ ☐ ☐

Good housekeeping in vehicle cabs?

☐ ☐ ☒

Spill control materials present?

☒ ☐ ☐

Layne Christensen Company Job Site Safety

C-41

Date 11/1/04

Site: TEAD Phase II PFL

Client: USACE

Rig/Crew: LAYNE - CHRISTENSEN DRILL CREW

Observers:

Crew Safety/PPE

YES NO N/A

YES NO N/A

Hard Hat

☒ ☐ ☐

Safety Glasses

☒ ☐ ☐

Lifting Belt/harness

☒ ☐ ☐

Training Certificates

☐ ☐ ☒

Gloves

☒ ☐ ☐

Hearing Protection

☒ ☐ ☐

Safety Shoes

☒ ☐ ☐

Proper Clothing

☒ ☐ ☐

Layne Safety Practice Manual

☐ ☐ ☒

Dust masks/Level C respirators

☒ ☐ ☐

DOT physical card, CDL and logbooks present and up to date?

☐ ☐ ☒

Emergency numbers/HASP present and posted?

☒ ☐ ☐

Comments: Agured Dust Masks and safety glasses ✓
Inspected Drum truck which will work has waste
Drums to 90-day yard now ✓

Site Set-up and Safety

Hole openings covered or tied off?

☐ ☐ ☒

Timbers and set-up jacks stable?

☒ ☐ ☐

Anchor guy lines secure, evenly tensioned and flagged?

☐ ☐ ☒

Mud or circulation pits barricaded or fenced?

☐ ☐ ☒

Excavation permit (CA) and shoring considerations?

☐ ☐ ☒

Traveling blocks, widow makers and elevators inspected?

☐ ☐ ☒

Site clean and organized? Footing?

☒ ☐ ☐

Bulk fuel stores lined and grounded?

☐ ☐ ☒

Pipe blocked and sloped from work area?

☒ ☐ ☐

Correct monitoring equipment present?

☒ ☐ ☐

Overhead and underground lines identified?

☐ ☐ ☒

Chemicals stored away from fuel and protected?

☐ ☐ ☒

Material Safety Data Sheets present?

☒ ☐ ☐

Warning signs/Exclusion zone posted?

☒ ☐ ☐

Comments:

Tires, Horns, Lights, batteries, brakes, wipers, fluid levels ✓

Rig Safety

Kill switch operational?

☒ ☐ ☐

All mast wiring in conduits?

☒ ☐ ☐

Vehicle pretrip inspection performed and documented?

☐ ☐ ☒

Seat belts available and used on all equipment?

☒ ☐ ☐

Fire extinguisher present and charged?

☒ ☐ ☐

First aid/BBP kit present and stocked?

☒ ☐ ☐

Danger points color coded?

☐ ☐ ☒

Controls identified?

☒ ☐ ☐

Side guardrails on platform rigs?

☐ ☐ ☒

Ropes and chains in good condition?

☒ ☐ ☐

Belts and rotating shafts guarded?

☒ ☐ ☐

All hooks have safety latches?

☒ ☐ ☐

Cables in good shape, clamps installed properly?

☒ ☐ ☐

Pressure hoses safety chained at connections?

☒ ☐ ☐

Good housekeeping in vehicle cabs?

☐ ☐ ☒

Spill control materials present?

☒ ☐ ☐

Layne Christensen Company Job Site Safety

C-41

Date 11/2/04

Site: TEAD Phase II RFI

Client: USACB

Rig/Crew: Tom Kern, Nate Salazar, Dave Kyle

Observers: Matt Lues, Carl Cole

Crew Safety/PPE

YES NO N/A

YES NO N/A

Hard Hat ☒ ☐ ☐

Safety Glasses ☒ ☐ ☐

Lifting Belt ☒ ☐ ☐

Training Certificates ☐ ☐ ☒

Gloves ☒ ☐ ☐

Hearing Protection ☒ ☐ ☐

Safety Shoes ☒ ☐ ☐

Proper Clothing ☒ ☐ ☐

Layne Safety Practice Manual ☐ ☐ ☒

Dust masks/Level C respirators ☒ ☐ ☐

DOT physical card, CDL and logbooks present and up to date? ☐ ☐ ☒

Emergency numbers/HASP present and posted? ☒ ☐ ☐

Comments: Change cracked fuel line. ✓
Change collapsed over road. ✓

Site Set-up and Safety

Hole openings covered or tied off? ☐ ☐ ☒

Timbers and set-up jacks stable? ☒ ☐ ☐

Anchor guy lines secure, evenly tensioned and flagged? ☐ ☐ ☒

Mud or circulation pits barricaded or fenced? ☐ ☐ ☒

Excavation permit (CA) and shoring considerations? ☐ ☐ ☒

Traveling blocks, widow makers and elevators inspected? ☐ ☐ ☒

Site clean and organized? Footing? ☒ ☐ ☐

Bulk fuel stores lined and grounded? ☐ ☐ ☒

Pipe blocked and sloped from work area? ☒ ☐ ☐

Correct monitoring equipment present? ☒ ☐ ☐

Overhead and underground lines identified? ☐ ☐ ☒

Chemicals stored away from fuel and protected? ☐ ☐ ☒

Material Safety Data Sheets present? ☒ ☐ ☐

Warning signs/Exclusion zone posted? ☒ ☐ ☐

Comments: Tires, Horns, Lights, batteries, brakes, wipers, fluid levels ✓

Rig Safety

Kill switch operational? ☒ ☐ ☐

All mast wiring in conduits? ☒ ☐ ☐

Vehicle pretrip inspection performed and documented? ☐ ☐ ☒

Seat belts available and used on all equipment? ☒ ☐ ☐

Fire extinguisher present and charged? ☒ ☐ ☐

First aid/BBP kit present and stocked? ☒ ☐ ☐

Danger points color coded? ☐ ☐ ☒

Controls identified? ☒ ☐ ☐

Side guardrails on platform rigs? ☐ ☐ ☒

Ropes and chains in good condition? ☒ ☐ ☐

Belts and rotating shafts guarded? ☒ ☐ ☐

All hooks have safety latches? ☒ ☐ ☐

Cables in good shape, clamps installed properly? ☒ ☐ ☐

Pressure hoses safety chained at connections? ☒ ☐ ☐

Good housekeeping in vehicle cabs? ☐ ☐ ☒

Spill control materials present? ☒ ☐ ☐

Layne Christensen Company Job Site Safety

C-41

Date 11/3/04

Site: TEAP Phase II RFI

Client: USACE

Rig/Crew: Tom Kern, Dave Kyle, Nate Salazar

Observers: Matt Ivers

Crew Safety/PPE

YES NO N/A

YES NO N/A

Hard Hat

☒ ☐ ☐

Safety Glasses

☒ ☐ ☐

Lifting Belt / Harness

☒ ☐ ☐

Training Certificates

☐ ☐ ☒

Gloves

☒ ☐ ☐

Hearing Protection

☒ ☐ ☐

Safety Shoes

☒ ☐ ☐

Proper Clothing

☒ ☐ ☐

Layne Safety Practice Manual

☐ ☐ ☒

Dust masks/Level C respirators

☒ ☐ ☐DOT physical card, CDL and logbooks
present and up to date?☐ ☐ ☒Emergency numbers/HASP present
and posted?☒ ☐ ☐

Comments:

I provided quality dust masks for
mixing grout today ✓

Site Set-up and Safety

Hole openings covered or tied off?

☐ ☐ ☒

Timbers and set-up jacks stable?

☒ ☐ ☐Anchor guy lines secure, evenly
tensioned and flagged?☐ ☐ ☒Mud or circulation pits barricaded
or fenced?☐ ☐ ☒Excavation permit (CA) and shoring
considerations?☐ ☐ ☒Traveling blocks, widow makers and
elevators inspected?☐ ☐ ☒

Site clean and organized? Footing?

☒ ☐ ☐

Bulk fuel stores lined and grounded?

☐ ☐ ☒

Pipe blocked and sloped from work area?

☒ ☐ ☐

Correct monitoring equipment present?

☒ ☐ ☐

Overhead and underground lines identified?

☒ ☐ ☐

Chemicals stored away from fuel and protected?

☐ ☐ ☒

Material Safety Data Sheets present?

☒ ☐ ☐

Warning signs/Exclusion zone posted?

☒ ☐ ☐

Comments:

Rig Safety

Kill switch operational?

☒ ☐ ☐

All mast wiring in conduits?

☒ ☐ ☐Vehicle pretrip inspection performed and
documented?☐ ☐ ☒Seat belts available and used on all
equipment?☒ ☐ ☐

Fire extinguisher present and charged?

☒ ☐ ☐

First aid/BBP kit present and stocked?

☒ ☐ ☐

Danger points color coded?

☐ ☐ ☒

Controls identified?

☒ ☐ ☐

Side guardrails on platform rigs?

☐ ☐ ☒

Ropes and chains in good condition?

☒ ☐ ☐

Belts and rotating shafts guarded?

☒ ☐ ☐

All hooks have safety latches?

☒ ☐ ☐

Cables in good shape, clamps installed properly?

☒ ☐ ☐

Pressure hoses safety chained at connections?

☒ ☐ ☐

Good housekeeping in vehicle cabs?

☐ ☐ ☒

Spill control materials present?

☒ ☐ ☐

EQUIPMENT CALIBRATION LOG

Tooele Army Depot

Eqpt. Type	Serial No.	Date	Calibration Time	Calibration Gas	Calibration Gas Lot No.	Calibrated By:	Comments
Environmental Instruments	580U-60884 329	9/15/04	10:00	100 PPM ISOBUTYLENE	903169	Matt Ivers	101.6 ppm D-12
Photo Ionization		9/16/04	9:45				102.2 "
Detector		10/7/04	11:50				99.2 D-13
580 B		"	13:40				97.8 "
		10/11/04	8:00				97.6 "
		10/19/04	12:05				103.4 D-16
		10/20/04	8:35				101.2 "
		11/1/04	8:05				96.7 C-41
		11/2/04	12:55				97.6 "
		11/11/04	7:45				103.4 C-42
		11/19/04	9:25				104.3 C-44
		11/22/04	9:10				104.8 "
		12/7/04	12:45				101.2 C-43
		12/30/04	7:55				103.4 D-14
		1/4/05	8:50				104.2 "
		1/5/05	9:35				102.6 "
		1/6/05	11:25				103.4 "





Attachment 7-1

APPENDIX C






DRILLING LOG	DIVISION Sacramento	INSTALLATION Tooele Army Depot	SHEET 1 OF 10 SHEETS
1. PROJECT Phase II RFI @ SWMU 58		10. SIZE AND TYPE OF BIT 8" OD open Face	
2. LOCATION (Coordinates or Station) 7364933.324 N 1406930.413 E		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY Layne Geosconstruction		12. MANUFACTURER'S DESIGNATION OF DRILL Drill Systems - AP1000 Becker Hammer	
4. HOLE NO. (As shown on drawing title and file number) C-41		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 75
5. NAME OF DRILLER Tom Kern		UNDISTURBED 0	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		14. TOTAL NUMBER CORE BOXES _____	
7. THICKNESS OF OVERBURDEN 375'		15. ELEVATION GROUND WATER 338.76 TOC 11/9/04	
8. DEPTH DRILLED INTO ROCK 0'		16. DATE HOLE	STARTED 10/28/04
9. TOTAL DEPTH OF HOLE 375'		COMPLETED 11/5/04	
		17. ELEVATION TOP OF CASING: 4804.70 GRND 4801.67	
		18. TOTAL CORE RECOVERY FOR BORING _____ %	
		19. SIGNATURE OF INSPECTOR <i>Walt</i>	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
8:29	2		Clayey Silt w/ gravel (ML) high plasticity, 20-30% Cobble & Gravel, Dark Gray 5YR 4/1, Moist	X	0	The Becker Hammer method allows a maximum clast size of 6" to be delivered to the surface therefore quantities of cobble or boulders above 6" cannot be determined
	4			X	1	
	6			X	1	
	8		- Silty Gravel (GM) 20% cobble 60% gravel 20% Silt or very fine	X	2	
8:42	10		sand, Cobble to 8" clasts are subround to sub angular, Predominantly	X	2	1.3 MIN/ft
8:49	12		Quartzite & Limestone, trace extrusive volcanic +	X	3	
	14		sandstones, Brown 7.5YR 5/2 to 7.5YR 7 (light grey)	X	3	
	16		Moist, caliche skin on majority of clasts	X	3	
	18			X	4	
	20		- * clasts are subrounded to subangular and appear water worn unless otherwise indicated	X	4	1.2 MIN/ft
	22			X	5	
	24			X	5	
	26			X	5	
	28			X	5	
9:00	30			X	5	1.3 MIN/ft
9:12						
9:25						

TEAD Phase II RFI			C-41	SIGNATURE OF INSPECTOR		DATE	10/28/04	2 of 10	
TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	RECOVERY	SAMPLE NO.	REMARKS			
9:32			Poorly Graded Gravel with sand (GP) 10-30% Cobble to 6", 20-60% gravel, fine to coarse 10-50% sand fine to coarse, trace silt clasts are subangular to subangular, no plasticity Brown 10YR 5/3 to light grey 10YR 6/1, Dry	X	6				
	32								
	34								
	36				X	7			
	38						0.7 min/ft		
9:39	40				X	8			
9:49	42								
	44								
	46				X	9			
	48								
9:58	50				X	10	0.9 min/ft		
10:03	52								
	54								
	56				X	11			
	58								
10:17	60				X	12	1.4 min/ft		
10:22	62								
	64								
	66				X	13			
	68								
10:37	70						1.5 min/ft		





TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	RECOVERY	SAMPLE NO.	REMARKS
10:42	72		as sample #6	X	14	
	74					
	76			X	15	
	78					
10:53	80					1.1 min/ft
10:58	82			X	16	
	84					
	86			X	17	
	88					
11:11	90			X	18	1.3 min/ft
11:16	92					
	94					
	96			X	19	
	98					
11:26	100			X	20	1.0 min/ft
11:32	102					
	104					
	106			X	21	
	108					
11:38	110					0.6 min/ft


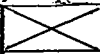







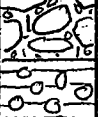













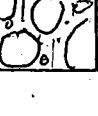


TEAD Phase II RFI				C-41	DATE	10/28/04	4 of 10	
TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	RECOVERY	SAMPLE NO.	REMARKS		
11:40	112		as sample #6	X	22			
	114							
	116			X	23			
	118							
11:49	120					0.9 mm/ft		
11:53	122			X	24			
	124							
	126			X	25			
	128							
11:59	130			X	26	0.6 mm/ft cyclone plugged crew dismantles		
12:33	132							
	134							
	136			X	27			
	138							
12:45	140					1.2 mm/ft		
12:54	142			X	28			
	144							
	146			X	29			
	148							
13:07	150					1.3 mm/ft		

TEAD Phase II RFI			C-41	DATE	10/28/04	5 of 10
TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	RECOVERY	SAMPLE NO.	REMARKS
13:11	152		- cemented zone (strongly cemented)	X	30	
	154					
	156			X	31	
	158					
13:28	160		as sample #6	X	32	1.7 min/ft
13:34	162					
	164					
	166			X	33	
	168					
13:48	170			X	34	1.4 min/ft
13:53	172					
	174					
	176			X	35	
	178					
14:18	180			X	36	2.5 min/ft
14:23	182					
	184					
	186			X	37	
	188					
14:54	190					3.1 min/ft

PROJECT
TEAD Phase II RFI

HOLE NO. C-41

TEAD Phase II RFI			C-41	DATE	10/28/04	6 of 10
TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	RECOVERY	SAMPLE NO.	REMARKS
15:02	192		as sample #6	X	38	
	194					
	196			X	39	
	198					
15:30	200			X	40	2.8 min/ft
15:34	202					
	204			X	41	
	206					
	208			X	42	1.6 min/ft
15:50	210					fuel line replaces
16:08	212					
	214			X	43	
	216					
	218			X	44	1.6 min/ft
16:24	220					
16:29	222					
	224			X	45	
	226					
	228					
16:48	230					1.9 min/ft

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	RECOVERY	SAMPLE NO.	REMARKS
10/29/04 @ 8:21	232		- Poorly Graded Gravel (GP) with silty sand		46	
	234		15% cobble to 6" 60% gravel, fine to coarse, subround to subangular, limestones + quartzites, trace volcanic (extrusive) and sandstones, 25% fine sand and silt		47	
8:59	236					
9:04	238		Brown 10YR 5/3 Dry, occasional layers of strong cementation		48	3.8 min/ft
	240					
	242					
	244					
	246		- Gravelly Clay (CL), high plasticity, ~ 20% fine gravel, reddish brown 5YR 4/3, Moist		49	
9:36	248		- Strongly Cemented			3.2 min/ft
9:49	250				50	Crew changes out rod trucks
	252					
	254		- as sample 46			
	256				51	
	258					
10:06	260				52	1.7 min/ft
10:09	262					
	264					
	266				53	
	268					
10:37	270					2.8 min/ft

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	RECOVERY	SAMPLE NO.	REMARKS
10:41	272		Poorly Graded Gravel with silty sand (GP) 10-20% cobble to 5"		54	
	274		40-60% gravel, fine to coarse, subangular to subround, 20-40% fine sand or silt, Brown		55	
	276		7.5 YR 5/2 to light grey			
	278		5 YR 7/1, Dry, occasional zones of well cemented matrix material		56	1.4 min/ft
10:55	280					
10:59	282					
	284				57	
	286					
	288					
11:16	290		- as above		58	1.7 min/ft
11:20	292					
	294				59	
	296					
11:43	298					fuel line break
12:15	300				60	2.9 min/ft
12:21	302					
12:25	304					
	306		- as above		61	
	308					
12:34	310					0.9 min/ft

PROJECT		HOLE NO.		SIGNATURE OF INSPECTOR		DATE	9 of 10
TEAD Phase II RFI		C-41		<i>[Signature]</i>		10/29/04	
TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	RECOVERY	SAMPLE NO.	REMARKS	
12:38			- as sample 54		62		
	312						
	314						
	316				63		
	318						
13:05	320					2.7 mm/ft	
13:08			- Silty Clay (CI) trace fine gravel, high plasticity Reddish brown 5YR 5/3 Moist		64		
	322						
	324		- strongly cemented gravel		65		
	326						
13:28	328		- Silty Gravel w/sand (GM) 30% Cobble to 4" 80% gravel 20% sand 20% silt, light gray 5YR 7/1, Dry			2.0 mm/ft	
13:34	330				66		
	332						
	334		- Silty Sand (SM) moderate plasticity, yellowish brown 10YR 5/4 moist		67		
	336		- Lean Clay (CL) highly plastic, trace fine gravel light reddish brown 5YR 6/3 moist				
	338		- Poorly Graded Gravel (GP) 20% cobble, 40% gravel 40% sand brown 10YR 5/3, Dry			2.9 mm/ft	
14:03	340				68		
14:07	342		- strongly cemented				
	344		- as above (GP)				
14:15	346				69	- unplug cyclone	
14:22	348						
	350		- first free water observed			1.6 mm/ft	
14:30							
PROJECT		HOLE NO.					

final water
level 335.2

initial
water
level

PID
0.4

PROJECT		HOLE NO.		SIGNATURE OF INSPECTOR		DATE	10 of 10	
TEAD Phase II RFI		C-41		[Signature]		11/1/04	PID	
TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	RECOVERY	SAMPLE NO.	REMARKS		
11/1/04 @ 9:22	352		Poorly Graded Gravel (GP) 20% cobble to 5", 70% Gravel 10% coarse sand, subround to subangular, Multicolor (water washes away fines which give soil a single color), wet		70		0.4	
	354							
	356		strongly cemented matrix		71		1.0	
10:45 13:30 on 11/2/04	358					inner barrel at 0-10' collapsed - trip out 2.5 min/ft		
13:38 13:42	360				72		0.6	
	362		as sample 70, abundant volcanic clasts					
	364							
	366		Sandy Clay (CL), high plasticity, some fine gravel med to coarse sand, Reddish brown S/R 5/4, wet		73		0.2	
	368							
13:59 14:05	370		as sample 72		74	1.7 min/ft	0.0	
	372		weakly cemented matrix					
	374		as sample 72		75	3.4 min/ft	0.0	
14:22	376	EOH						
	378							
	380							
	382							
	384							
	386							
	388							
	390							



Integrated Subsurface Evaluation

311 Rock Avenue • Golden, CO 80401

PH 303.526.4432 • FAX 303.526.4426

email: PedlerRAS@aol.com • www.rasinc.org

C-41

COMPANY : US AEC
WELL : C-41
LOCATION/FIELD : TEAD
COUNTY : TOOELE
LOCATION : UTAH
SECTION :

OTHER SERVICES:



TOWNSHIP : RANGE :

DATE : 12/08/04
API NO. DRILLER :
LOG BOTTOM : 374.00
LOG TOP : 3.10

PERMANENT DATUM : TOSC

KB : NA
DF :
GL : na

LOG MEASURED FROM: TOSC
DRL MEASURED FROM: NA

CASING DIAMETER : 0
CASING TYPE : PVC
CASING THICKNESS : 0
RUN NO. : 1

LOGGING UNIT : 202
FIELD OFFICE :
RECORDED BY : whp

BIT SIZE : 6
MAGNETIC DECL. : 0
MATRIX DENSITY : 2.71
NEUTRON MATRIX : Dolomite
CASING OD : 4

BOREHOLE FLUID : 0
RM : 0
RM TEMPERATURE : 0
MATRIX DELTA T : 140

FILE : ORIGINAL
TYPE : 9512A

THRESH: 4000

WITNESSED BY : NA

ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS



Date: 09/23/2005
Project Number 48743.1B

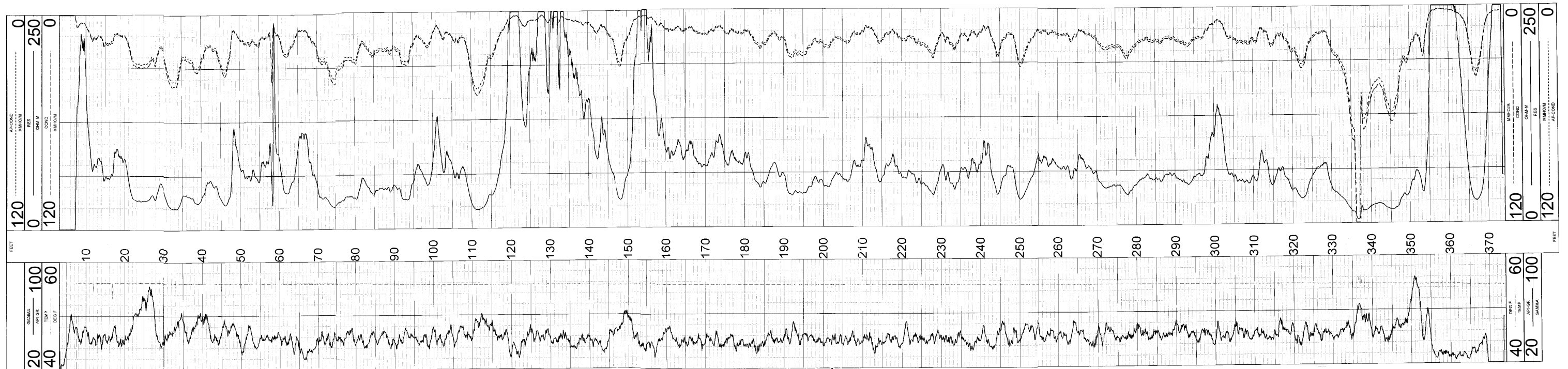
TEAD Phase II RFI

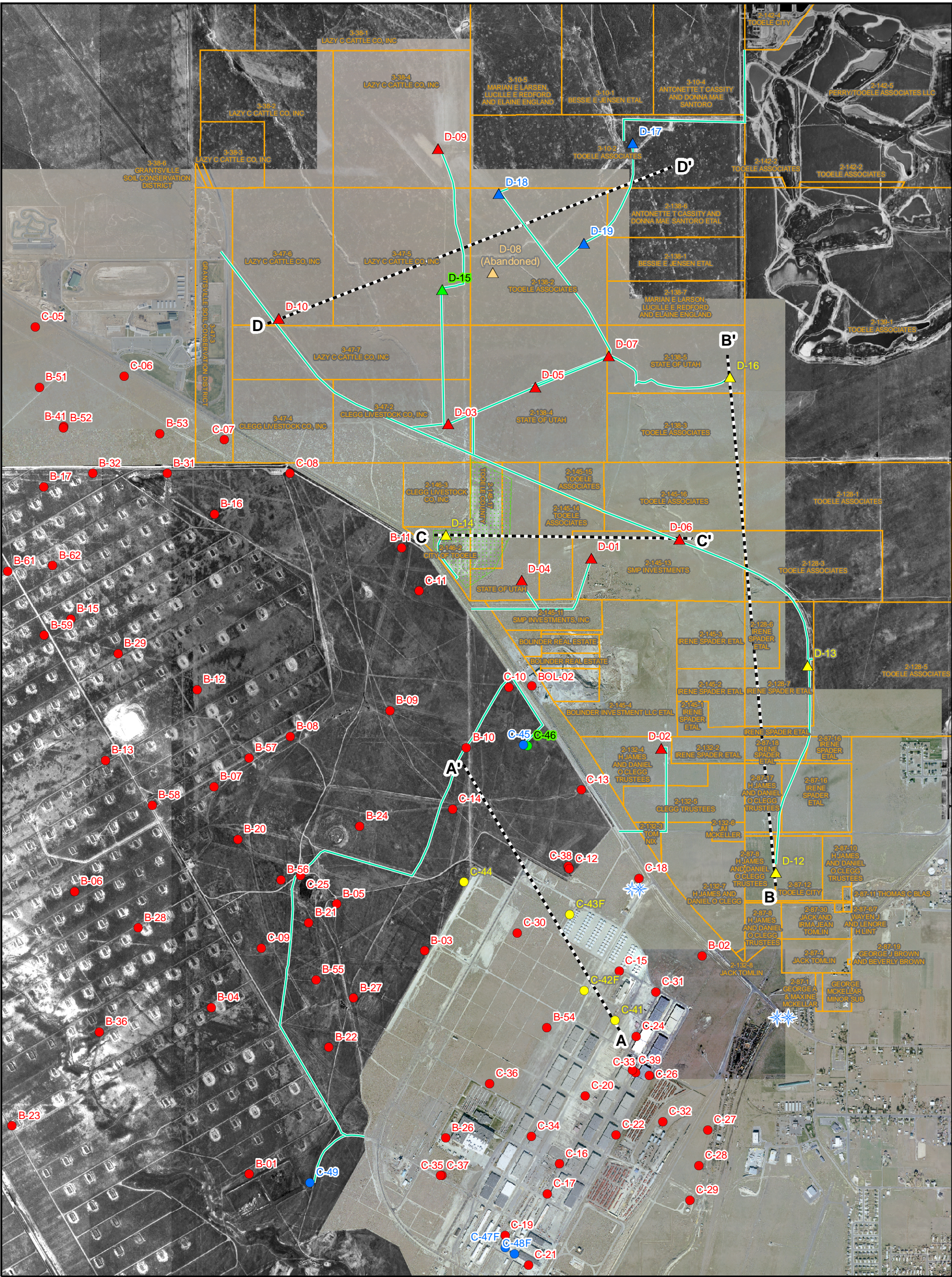
**WELL C-41
NATURAL GAMMA AND
INDUCTION ELECTRICAL LOGS**

SLC5Q232.ppt

PLATE

C-2a





Offsite Groundwater Monitoring Wells <ul style="list-style-type: none">▲ Phase I RFI Well▲ Phase I RFI Well - Abandoned▲ Phase II RFI - Installed Fall-Winter 2004▲ Phase III RFI - Installed Summer 2005▲ Proposed Phase II RFI Well TEAD/UID Groundwater Monitoring Wells <ul style="list-style-type: none">● Existing Well● Phase II RFI Well - Installed Fall-Winter 2004● Phase II RFI Well - Installed Summer-Fall 2005● Proposed Phase II RFI Well	LEGEND <ul style="list-style-type: none">★ Survey Benchmark— Approximate Phase II RFI Well Access Route----- Cross Section Line▨ Former Landfill▭ Parcel Boundaries / Owners	SWMU 58 PHASE II RFI TOOELE ARMY DEPOT TOOELE, UTAH 0 900 1,800 Feet ↑	PLATE C-3 GROUNDWATER MONITORING WELL LOCATION MAP
--	---	---	---



311 Rock Avenue • Golden, CO 80401

PH 303.526.4432 • FAX 303.526.4426

Integrated Subsurface Evaluation email: PedlerRAS@aol.com • www.rasinc.org

C-41

COMPANY : US AEC
WELL : C-41
LOCATION/FIELD : TEAD
COUNTY : TOOELE
LOCATION : UTAH
SECTION :

OTHER SERVICES:

TOWNSHIP :

RANGE :

DATE : 12/08/04
API NO. DRILLER :
LOG BOTTOM : 374.00
LOG TOP : 3.10

PERMANENT DATUM : TOSC

KB : NA

LOG MEASURED FROM: TOSC

DF :

DRL MEASURED FROM: NA

GL : na

CASING DIAMETER : 0
CASING TYPE : PVC
CASING THICKNESS: 0
RUN NO. : 1

LOGGING UNIT : 202

FIELD OFFICE :

RECORDED BY : whp

BIT SIZE : 6
MAGNETIC DECL. : 0
MATRIX DENSITY : 2.71

BOREHOLE FLUID : 0

FILE : ORIGINAL

RM : 0

TYPE : 9512A

RM TEMPERATURE : 0

NEUTRON MATRIX : Dolomite
CASING OD : 4

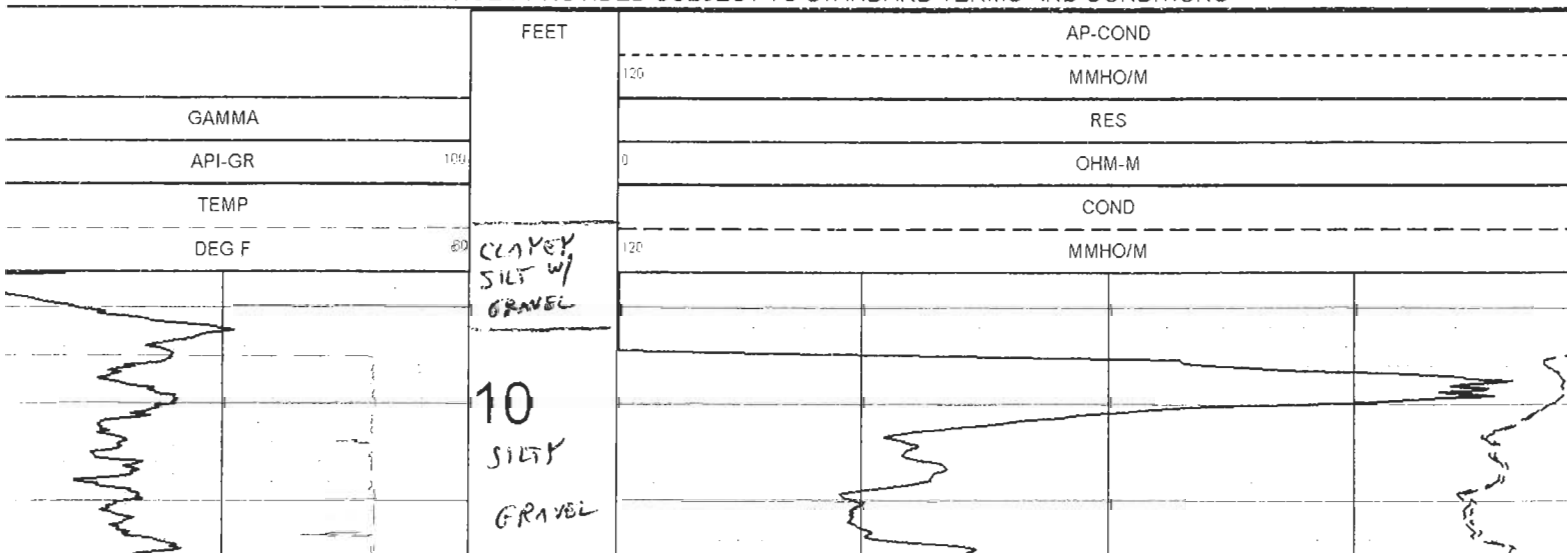
MATRIX DELTA T : 140

THRESH: 4000

ADDITION OF BOREHOLE GEOLOGY (FROM MIST IVORY GEOLOGIC BOREHOLE LOG)
AND INTERPRETATION OF GAMMA AND INDUCTION ELECTRIC LOG BY R. JIRIK

WITNESSED BY : NA

ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS

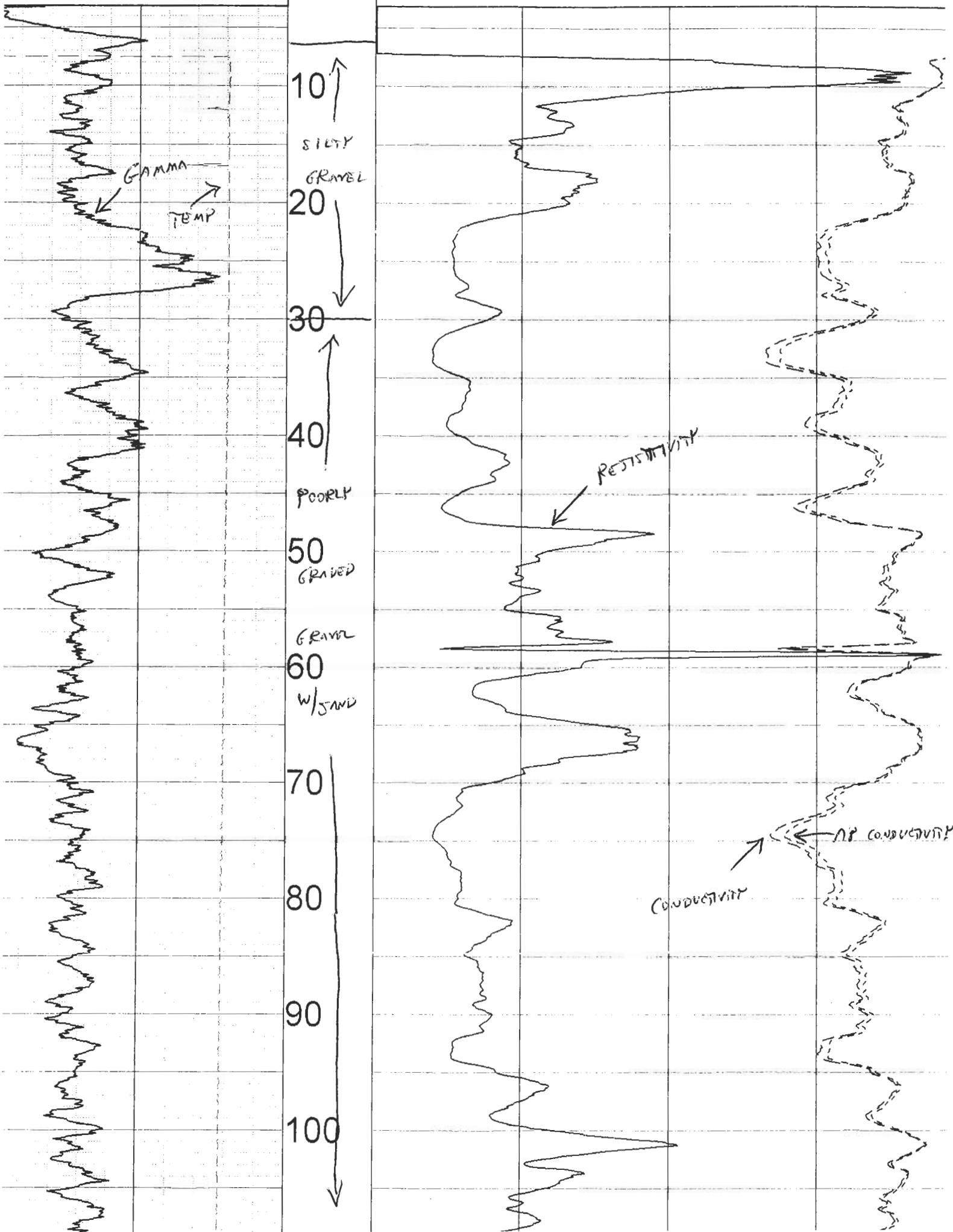


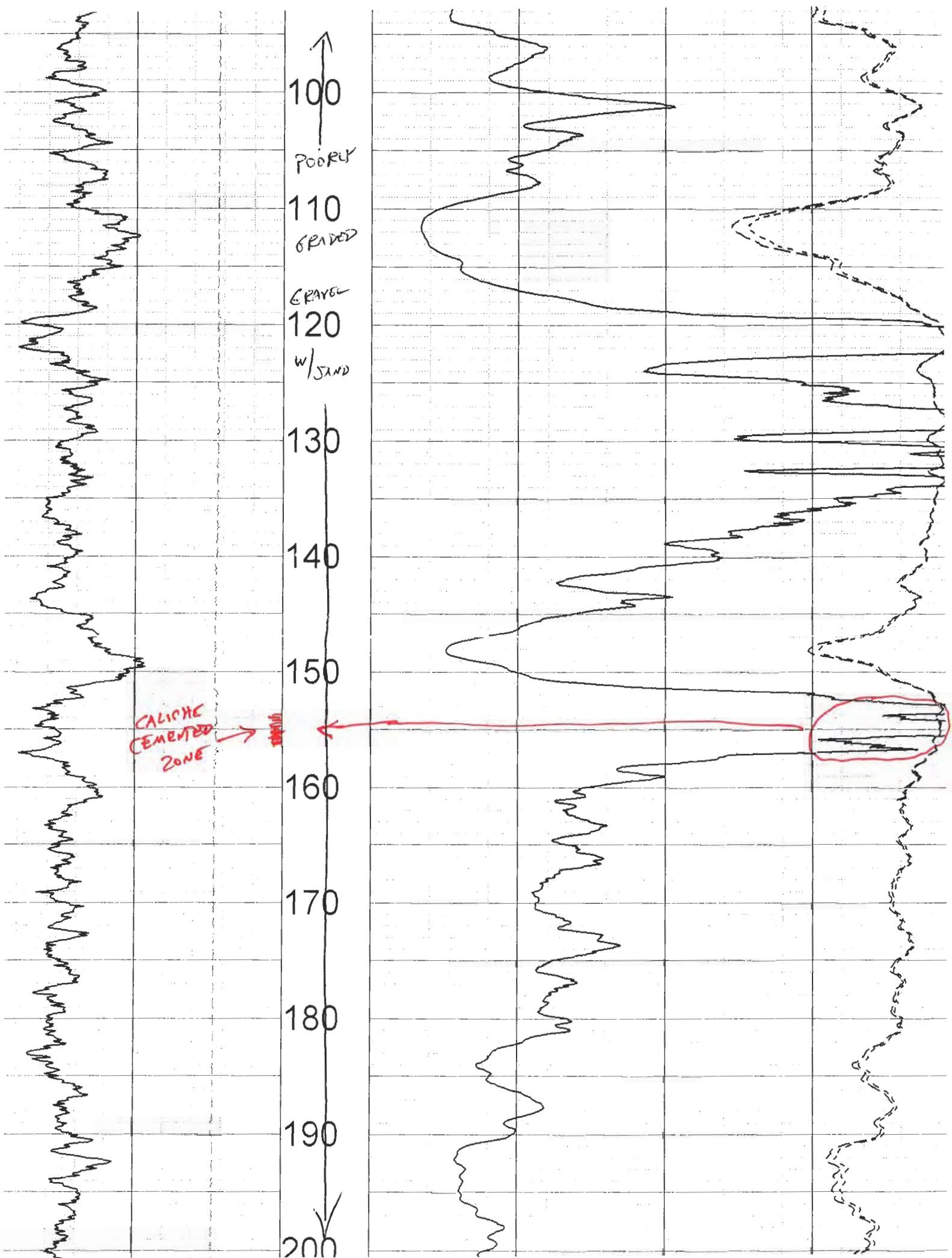
DEG F

60

120

MMHO/M





190

POORLY

200

GRADED

GRAVEL

210

w/
SAND

220

230

CALICHE
CEMENTED
ZONES

POORLY

GRADED

GRAVEL

240

w/SLTY
SAND

GRAVELLY
CLAY

250

POORLY

CALICHE
CEMENTED
ZONES

260

GRADED

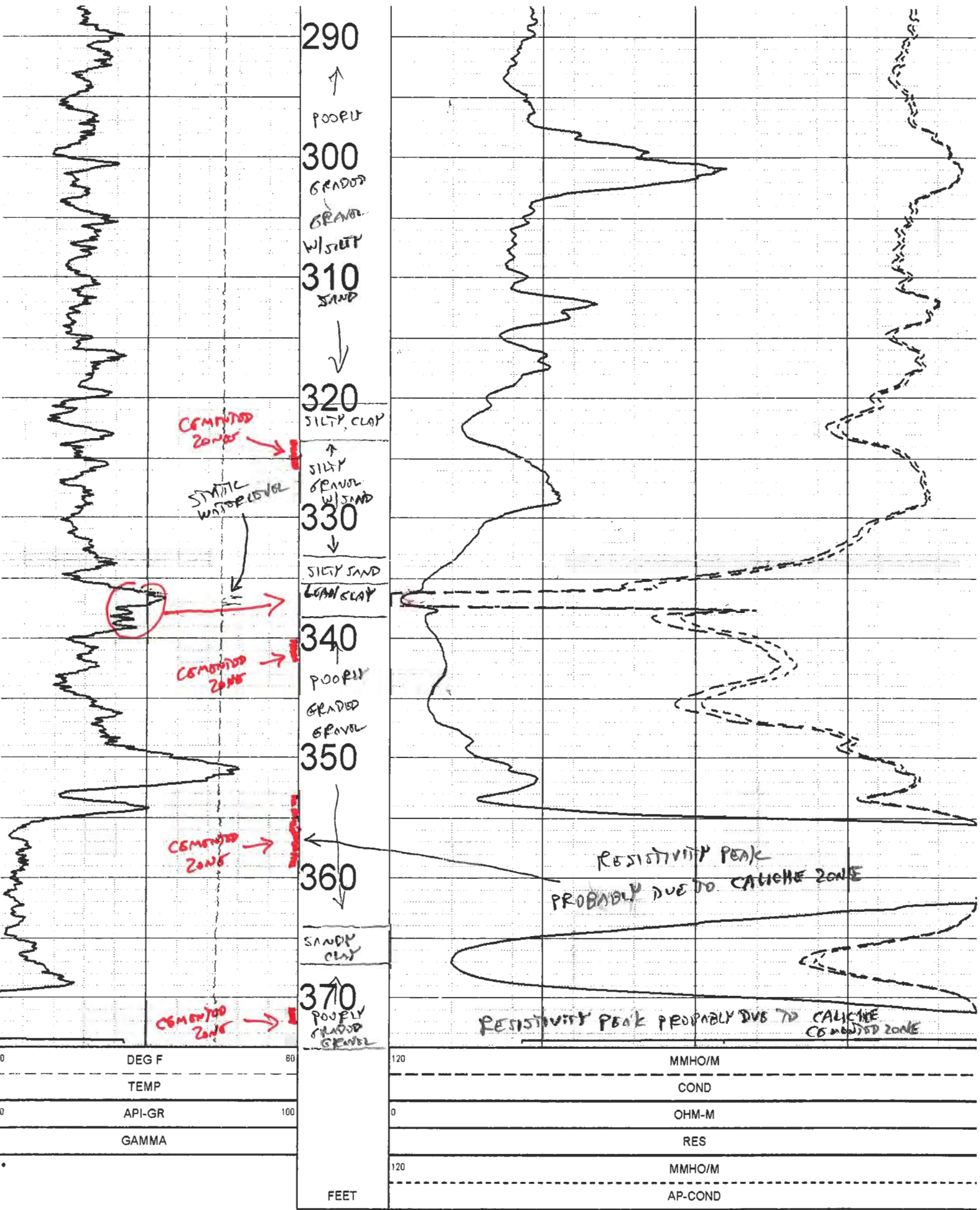
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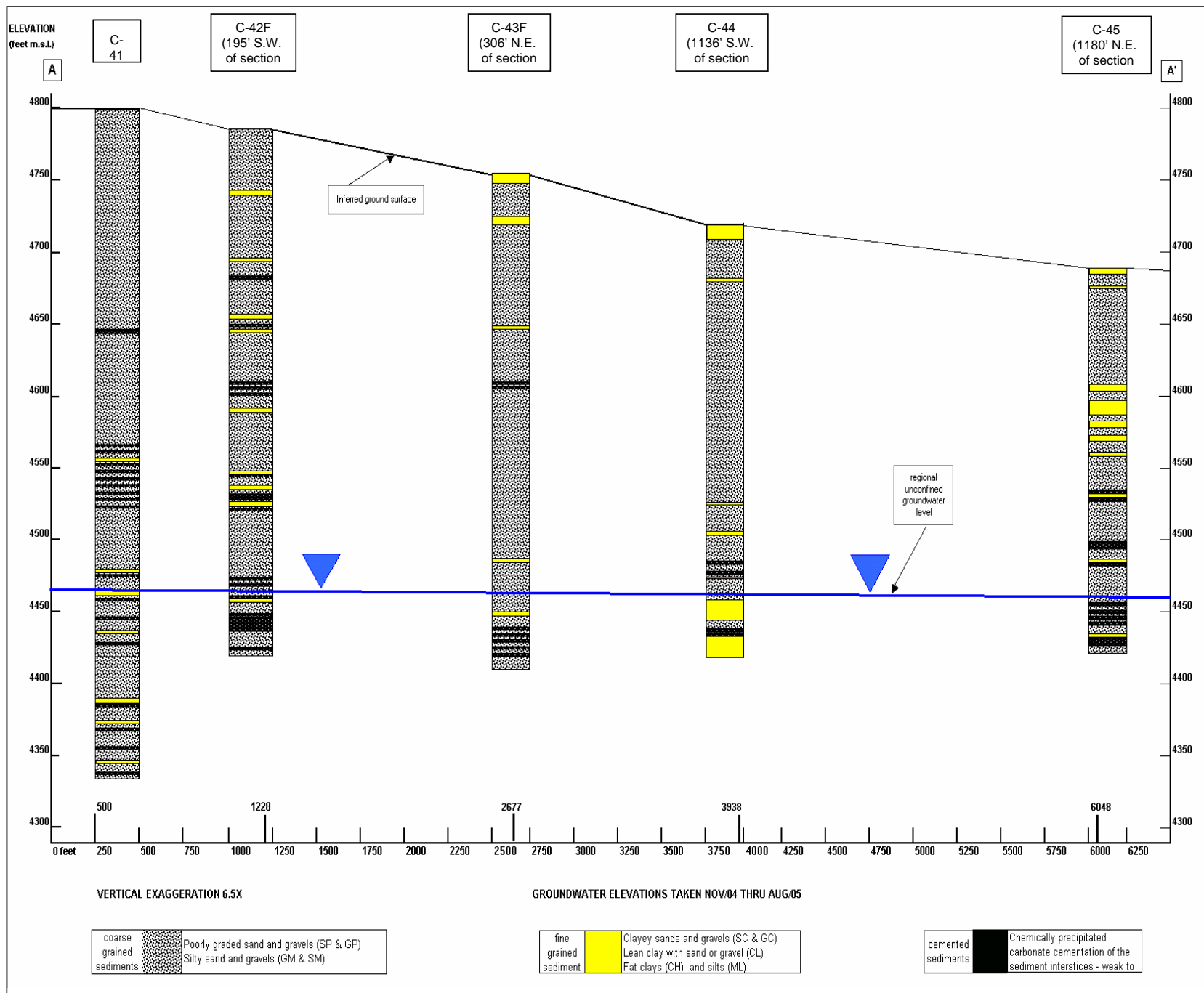
270

w/
SLTY SAND

280

290





APPENDIX D

PLATE
D-1

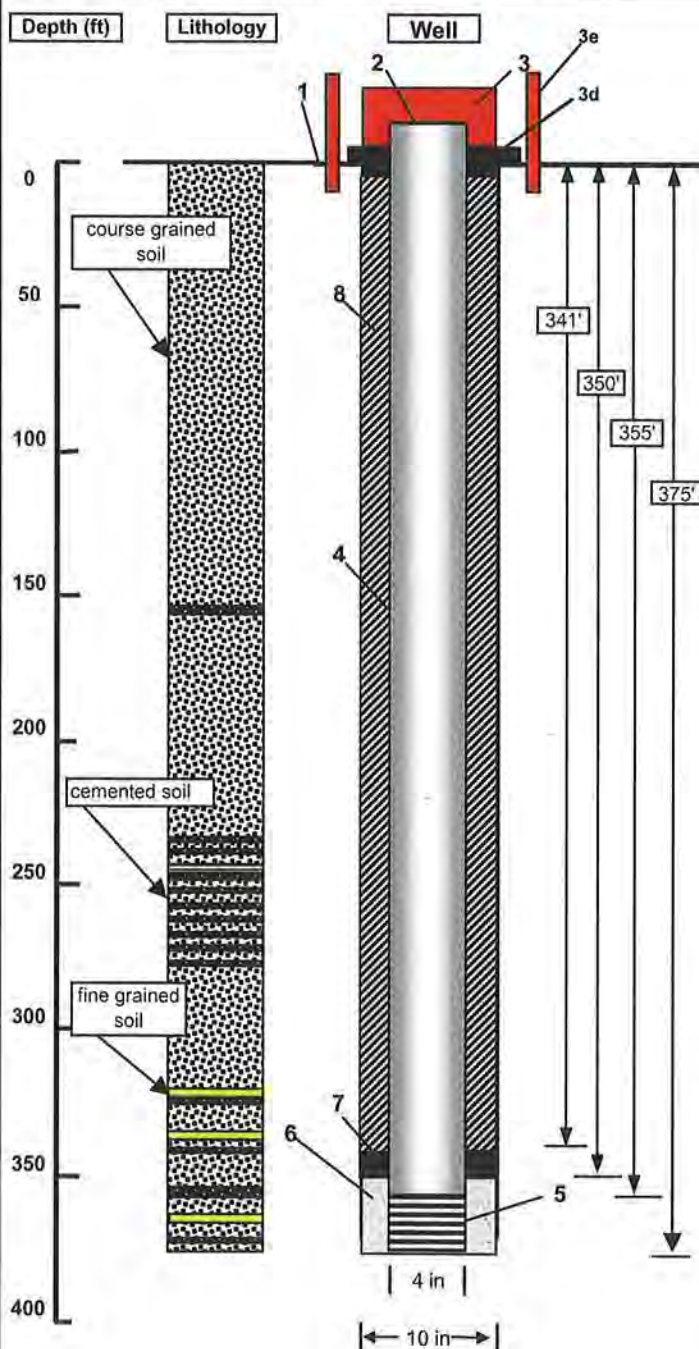
MONITORING WELL INSTALLATION DATA RECORD

LOCATION: Tooele County, Utah

DRILLER: Tom Kearn

HELPERS: Nate Salazar, Mike Winmill

GEOLOGIST: Matt Ivers



1- Ground elevation at well :	4802.317 feet (brass cap)
2- Measuring point elevation :	4804.702 feet (top of well casing)
3- Surface completion casing :	
a) type / diameter (ID/ OD)	Steel - 10 inch ID / 10 3/8 inch OD
b) height above ground	3 feet
c) length below ground	3 feet
d) type / quantity of sealant	Portland cement / 16 - 92.6 lb bags
e) protective bollards	4 - 4 inch steel concrete filled (4' ags - 2' bgs)
4- Well casing :	
a) type / diameter (ID/ OD)	Schedule 40 PVC / 4 inch
b) height above ground	2.38 feet
c) length below ground	376 feet
d) type / quantity of sealant	see # 8
e) well centralizers	none
5- Well screen :	
a) type / diameter (ID/ OD)	Schedule 40 PVC / 4 inch
b) slot size	.010 inch
c) lengths	2 - 10 foot sections (355.79 to 375.79 feet bgs)
6- Well screen filter pack :	
a) type	#16 / 40 Colorado Silica Sand
b) quantity used	20 - 50 lb bags
c) method of placement	poured from surface
d) length	350 to 375 feet bgs
7- Bentonite seal :	
a) type/quantity	Cetco coated pellets / 4 - 5 gallon buckets
b) length	341 to 350 feet bgs
8- Grout :	
a) grout mix used per batch	28 gal water to 2 - 50 lb bags bentonite grout
b) method of placement	pumped from surface
c) qty of well casing grout	109 bags (approx 1526 gallons)
Well development :	
a) method	bail and swab / pump and back-flush
b) time	3 hour 18 minutes / 2 hours 59 minutes
Pumping tests :	
a) drawdown / time	0.12 feet / 20 minutes
b) pumping rate	4 gpm

SUMMARY OF WELL SURVEY DATA **TEAD Phase II RFI Groundwater Monitoring Wells**

-----Elevations (ft above MSL)-----							
Well No.	Measuring Point	Brass Cap	Ground Surface	Top of	Bottom of	Measuring Point	
				Well Screen	Well Screen	Northing	Easting
C-41	4804.70	4802.32	4801.67	4445.68	4425.68	7364933.324	1406930.413
C-42F	4785.09	4785.52	4785.27	4445.27	4425.27	7365504.752	1406335.618
C-43F	4754.87	4755.23	4755.21	4436.21	4416.21	7366968.52	1406061.58
C-44	4722.81	4720.44	4719.82	4439.82	4419.82	7367591.88	1404021.61
C-45							
D-12	4803.05	4800.56	4800.25	4455.25	4435.25	7367777.995	1410018.176
D-13	4720.05	4717.40	4720.47	4358.47	4338.47	7371760.079	1410629.706
D-14	4592.80	4590.93	4590.39	4335.39	4315.39	7374264.49	1403669.88
D-16	4580.11	4577.75	4577.20	4346.20	4326.20	7377300.289	1409139.940
D-17							
D-18							
D-19							

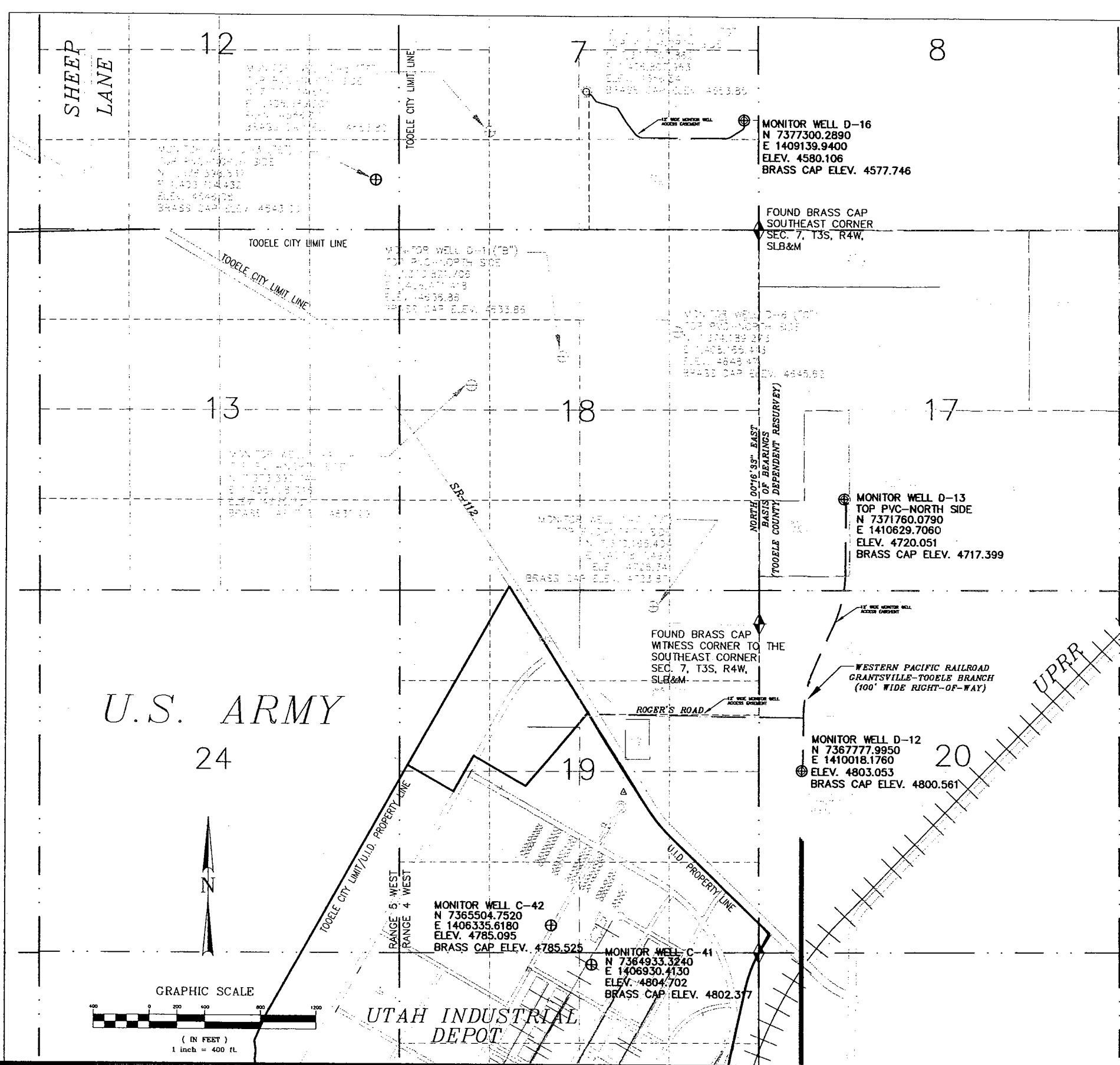
MSL: mean sea level

F for selected well identifiers designates flush-mount surface completion.

Coordinates for measuring point are US State plane 1983, Utah Central 4302, NAD 1983 (CONUS), GEO1D96 (continental US)

All survey data generated by Ward Engineering of Salt Lake City, Utah

C-45, D-17, D-18, and D-19 have not been surveyed as of 7/21/05.



UTAH INDUSTRIAL DEPOT MONITOR WELL AND ACCESS EASEMENT LEGAL DESCRIPTIONS

LEGAL DESCRIPTION - MONITOR WELL NO. C-41
COMMENCING AT THE NORTH QUARTER CORNER OF SECTION 30, TOWNSHIP 3 SOUTH, RANGE 4 WEST, SALT LAKE BASE AND MERIDIAN; AND RUNNING THENCE: THENCE NORTH 89°40'33" EAST ALONG THE NORTH LINE OF THE NORTHEAST QUARTER OF SAID SECTION 30, A DISTANCE OF 177.34 FEET; THENCE SOUTH 00°19'27" EAST, A DISTANCE OF 174.07 FEET TO THE CENTER POINT OF A PVC PIPE MARKING MONITOR WELL NO. C-41, AND POINT OF TERMINUS.

LEGAL DESCRIPTION - MONITOR WELL NO. C-42
COMMENCING AT THE SOUTH QUARTER CORNER OF SECTION 19, TOWNSHIP 3 SOUTH, RANGE 4 WEST, SALT LAKE BASE AND MERIDIAN; AND RUNNING: THENCE SOUTH 89°43'47" WEST ALONG THE SOUTH LINE OF THE SOUTHWEST QUARTER OF SAID SECTION 19, A DISTANCE OF 414.76 FEET; THENCE NORTH 00°16'13" WEST, A DISTANCE OF 400.46 FEET TO THE CENTER POINT OF A PVC PIPE MARKING MONITOR WELL NO. C-42, AND POINT OF TERMINUS.

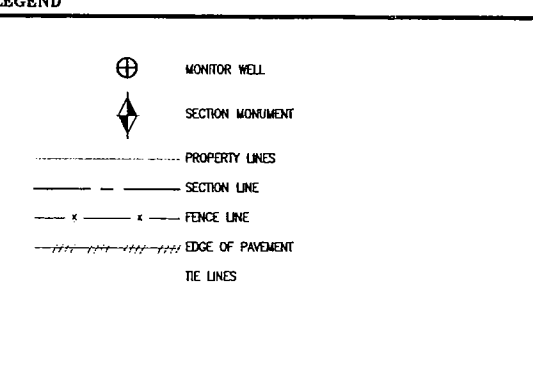
LEGAL DESCRIPTION - MONITOR WELL NO. D-12
A FIFTY FOOT DIAMETER WELL EASEMENT FOR THE PURPOSE OF ACCESSING MONITOR WELL NO. D-12, THE CENTER POINT OF WHICH IS DESCRIBED AS FOLLOWS:
COMMENCING AT THE WEST QUARTER CORNER OF SECTION 20, TOWNSHIP 3 SOUTH, RANGE 4 WEST, SALT LAKE BASE AND MERIDIAN; AND RUNNING THENCE NORTH 00°05'27" WEST ALONG THE WEST LINE OF THE SOUTHWEST QUARTER OF SAID SECTION 20, A DISTANCE OF 12.32 FEET; THENCE NORTH 89°54'33" EAST, A DISTANCE OF 627.80 FEET TO THE CENTER POINT OF A PVC PIPE MARKING MONITOR WELL NO. D-12, AND POINT OF TERMINUS.

WELL NO. D-12 - ACCESS EASEMENT LEGAL DESCRIPTION
A TWELVE (12) FOOT WIDE ACCESS EASEMENT FOR THE PURPOSE OF ACCESSING MONITOR WELL NO. D-12 FROM A PUBLIC HIGHWAY, THE CENTERLINE OF WHICH IS DESCRIBED AS FOLLOWS:
BEGINNING AT A POINT WHICH LIES SOUTH 00°00'42" EAST ALONG THE EAST LINE OF SECTION 19, TOWNSHIP 3 SOUTH, RANGE 4 WEST, SALT LAKE BASE AND MERIDIAN, A DISTANCE OF 1,332.55 FEET, AND SOUTH 89°54'33" WEST, A DISTANCE OF 2,346.78 FEET FROM A WITNESS CORNER TO THE NORTHEAST CORNER OF SAID SECTION 19, SAID POINT BEING ON THE EASTERLY RIGHT-OF-WAY LINE OF STATE ROUTE 112; AND RUNNING THENCE OVER AND ACROSS A PRESCRIPTIVE RIGHT-OF-WAY FOR ROGER'S ROAD THE FOLLOWING THREE (3) COURSES: SOUTH 89°11'52" EAST, A DISTANCE OF 1,865.02 FEET; THENCE SOUTH 89°49'44" EAST, A DISTANCE OF 766.25 FEET; THENCE SOUTH 89°13'27" EAST, A DISTANCE OF 371.00 FEET TO A POINT ON A DIRT ROAD WITHIN THE 100' WIDE RIGHT-OF-WAY OF THE WESTERN PACIFIC RAILROAD-GRANTSVILLE TOOELE BRANCH, ON FILE WITH THE TOOELE COUNTY RECORDER'S OFFICE, DATED MAY, 1917; THENCE SOUTH 00°41'04" WEST ALONG SAID DIRT ROAD, A DISTANCE OF 727.17 FEET TO A POINT ON THE PERIMETER OF THE FIFTY FOOT MONITOR WELL EASEMENT AND POINT OF TERMINUS.

LEGAL DESCRIPTION - MONITOR WELL NO. D-13
A FIFTY FOOT DIAMETER WELL EASEMENT FOR THE PURPOSE OF ACCESSING MONITOR WELL NO. D-13, THE CENTER POINT OF WHICH IS DESCRIBED AS FOLLOWS:
COMMENCING AT THE SOUTHWEST CORNER OF SECTION 17, TOWNSHIP 3 SOUTH, RANGE 4 WEST, SALT LAKE BASE AND MERIDIAN; AND RUNNING THENCE NORTH 00°16'57" WEST ALONG THE WEST LINE OF THE SOUTHWEST QUARTER OF SAID SECTION, A DISTANCE OF 1,341.40 FEET; THENCE NORTH 89°43'03" EAST, A DISTANCE OF 1,250.17 FEET TO THE CENTER POINT OF A PVC PIPE MARKING MONITOR WELL NO. D-13, AND POINT OF TERMINUS.

WELL NO. D-13 - ACCESS EASEMENT LEGAL DESCRIPTION
A TWELVE (12) FOOT WIDE ACCESS EASEMENT FOR THE PURPOSE OF ACCESSING MONITOR WELL NO. D-13 FROM A PUBLIC HIGHWAY, THE CENTERLINE OF WHICH IS DESCRIBED AS FOLLOWS:
BEGINNING AT A POINT WHICH LIES SOUTH 00°00'42" EAST ALONG THE EAST LINE OF SECTION 19, TOWNSHIP 3 SOUTH, RANGE 4 WEST, SALT LAKE BASE AND MERIDIAN, A DISTANCE OF 1,332.55 FEET, AND SOUTH 89°54'33" WEST, A DISTANCE OF 2,346.78 FEET FROM A WITNESS CORNER TO THE NORTHEAST CORNER OF SAID SECTION 19, SAID POINT BEING ON THE EASTERLY RIGHT-OF-WAY LINE OF STATE ROUTE 112; AND RUNNING THENCE OVER AND ACROSS A PRESCRIPTIVE RIGHT-OF-WAY FOR ROGER'S ROAD THE FOLLOWING THREE (3) COURSES: SOUTH 89°11'52" EAST, A DISTANCE OF 1,865.02 FEET; THENCE SOUTH 89°49'44" EAST, A DISTANCE OF 766.25 FEET; THENCE SOUTH 89°13'27" EAST, A DISTANCE OF 371.00 FEET TO A POINT ON A DIRT ROAD WITHIN THE 100' WIDE RIGHT-OF-WAY OF THE WESTERN PACIFIC RAILROAD-GRANTSVILLE TOOELE BRANCH, ON FILE WITH THE TOOELE COUNTY RECORDER'S OFFICE, DATED MAY, 1917 AND POINT OF CURVE OF A NON TANGENT CURVE TO THE RIGHT, OF WHICH THE RADIUS POINT LIES NORTH 88°31'02" EAST, A RADIAL DISTANCE OF 1,595.37 FEET; THENCE ALONG SAID DIRT ROAD THE FOLLOWING FOUR (4) COURSES: NORTHERLY ALONG THE ARC, THROUGH A CENTRAL ANGLE OF 26°12'16", A DISTANCE OF 729.65 FEET (CHORD BEARS NORTH 11°37'10" EAST, A DISTANCE OF 723.30 FEET); THENCE NORTH 24°11'57" EAST, A DISTANCE OF 713.62 FEET TO THE POINT OF CURVE OF A NON TANGENT CURVE TO THE LEFT, OF WHICH THE RADIUS POINT LIES NORTH 65°41'00" WEST, A RADIAL DISTANCE OF 1,902.79 FEET; THENCE NORTHERLY ALONG THE ARC, THROUGH A CENTRAL ANGLE OF 26°01'18", A DISTANCE OF 864.18 FEET (CHORD BEARS NORTH 11°18'21" EAST, A DISTANCE OF 856.77 FEET); THENCE NORTH 00°20'22" EAST, A DISTANCE OF 965.79 FEET TO A POINT ON THE PERIMETER OF THE FIFTY FOOT MONITOR WELL EASEMENT AND POINT OF TERMINUS.

LEGEND



LEGAL DESCRIPTIONS (CONT'D)

LEGAL DESCRIPTION - MONITOR WELL NO. D-16
A FIFTY FOOT DIAMETER WELL EASEMENT FOR THE PURPOSE OF ACCESSING MONITOR WELL NO. D-16, THE CENTER POINT OF WHICH IS DESCRIBED AS FOLLOWS:
COMMENCING AT THE SOUTHEAST CORNER OF SECTION 7, TOWNSHIP 3 SOUTH, RANGE 4 WEST, SALT LAKE BASE AND MERIDIAN; AND RUNNING THENCE NORTH 00°21'59" WEST ALONG THE EAST LINE OF THE SOUTHEAST QUARTER OF SAID SECTION 7, A DISTANCE OF 1,609.58 FEET; THENCE SOUTH 89°38'01" WEST, A DISTANCE OF 210.45 FEET TO THE CENTER POINT OF A PVC PIPE MARKING MONITOR WELL NO. D-16, AND POINT OF TERMINUS.

WELL NO. D-16 - ACCESS EASEMENT LEGAL DESCRIPTION
A TWELVE (12) FOOT WIDE ACCESS EASEMENT FOR THE PURPOSE OF ACCESSING MONITOR WELL NO. D-16 FROM MONITOR WELL NO. D-7, THE CENTERLINE OF WHICH IS DESCRIBED AS FOLLOWS:
BEGINNING AT A POINT WHICH LIES 89°42'03" WEST ALONG THE SOUTH LINE OF THE SOUTHEAST QUARTER OF SECTION 7, TOWNSHIP 3 SOUTH, RANGE 4 WEST, SALT LAKE BASE AND MERIDIAN, A DISTANCE OF 2,501.20 FEET, AND NORTH 00°17'59" WEST, A DISTANCE OF 1,995.93 FEET FROM THE SOUTHEAST CORNER OF SAID SECTION 7, SAID POINT BEING THE BEGINNING OF A CURVE TO THE RIGHT, OF WHICH THE RADIUS POINT LIES SOUTH 25°32'41" WEST, A RADIAL DISTANCE OF 150.00 FEET; AND RUNNING THENCE SOUTHEASTERLY ALONG THE ARC, THROUGH A CENTRAL ANGLE OF 25°51'49", A DISTANCE OF 67.71 FEET; THENCE SOUTH 35°59'57" EAST, A DISTANCE OF 76.49 FEET TO A POINT OF CURVE TO THE LEFT HAVING A RADIUS OF 50.00 FEET AND A CENTRAL ANGLE OF 37°52'57", THENCE SOUTHEASTERLY ALONG THE ARC A DISTANCE OF 33.06 FEET; THENCE SOUTH 73°52'54" EAST, A DISTANCE OF 289.60 FEET TO A POINT OF CURVE TO THE RIGHT HAVING A RADIUS OF 50.00 FEET AND A CENTRAL ANGLE OF 42°17'33", THENCE SOUTHEASTERLY ALONG THE ARC A DISTANCE OF 36.91 FEET; THENCE SOUTH 31°35'21" EAST, A DISTANCE OF 215.71 FEET; THENCE SOUTH 37°38'09" EAST, A DISTANCE OF 227.09 FEET TO A POINT OF CURVE TO THE LEFT HAVING A RADIUS OF 150.00 FEET AND A CENTRAL ANGLE OF 52°23'01", THENCE SOUTHEASTERLY ALONG THE ARC A DISTANCE OF 137.14 FEET; THENCE NORTH 89°58'50" EAST, A DISTANCE OF 1,218.55 FEET TO A POINT OF CURVE TO THE LEFT HAVING A RADIUS OF 150.00 FEET AND A CENTRAL ANGLE OF 32°46'33", THENCE EASTERLY ALONG THE ARC A DISTANCE OF 85.81 FEET; THENCE NORTH 57°12'17" EAST, A DISTANCE OF 201.46 FEET TO A POINT OF CURVE TO THE LEFT HAVING A RADIUS OF 50.00 FEET AND A CENTRAL ANGLE OF 52°33'46", THENCE NORTHEASTERLY ALONG THE ARC A DISTANCE OF 45.87 FEET; THENCE NORTH 04°38'31" EAST, A DISTANCE OF 47.80 FEET TO A POINT ON THE PERIMETER OF THE FIFTY FOOT MONITOR WELL EASEMENT AND POINT OF TERMINUS.

THE BASIS OF BEARINGS FOR THIS SURVEY IS NORTH 00°16'33" EAST BETWEEN THE FOUND WITNESS CORNER MONUMENT FOR THE NORTHEAST CORNER OF SECTION 19, TOWNSHIP 3 SOUTH, RANGE 4 WEST, SALT LAKE BASE AND MERIDIAN, AND THE FOUND MONUMENT FOR THE SOUTHEAST CORNER OF SECTION 7, TOWNSHIP 3 SOUTH, RANGE 4 WEST, SALT LAKE BASE AND MERIDIAN.

NARRATIVE OF BOUNDARY:

THE PURPOSE OF THIS SURVEY MAP IS TO SHOW THE LOCATIONS OF FIVE MONITOR WELLS AND ACCESS ROUTES TO THE THREE "D" SERIES WELLS. COORDINATES FOR THE WELL LOCATIONS HAVE BEEN FURNISHED IN THE NAD 27 STATE PLANE CENTRAL ZONE. ELEVATIONS ARE ON THE NGVD 29 SYSTEM.

BASIS OF BEARINGS:

THE BASIS OF BEARINGS FOR THIS SURVEY IS NORTH 00°16'33" EAST BETWEEN THE FOUND WITNESS CORNER MONUMENT FOR THE NORTHEAST CORNER OF SECTION 19, TOWNSHIP 3 SOUTH, RANGE 4 WEST, SALT LAKE BASE AND MERIDIAN, AND THE FOUND MONUMENT FOR THE SOUTHEAST CORNER OF SECTION 7, TOWNSHIP 3 SOUTH, RANGE 4 WEST, SALT LAKE BASE AND MERIDIAN.

SURVEYOR'S CERTIFICATE:

I, ROBERT O. BAKER DO HEREBY CERTIFY THAT I AM A REGISTERED LAND SURVEYOR LICENSED TO PRACTICE IN THE STATE OF UTAH, AND THAT I HOLD LICENSE NO. 172816. I FURTHER CERTIFY THAT I HAVE MADE A SURVEY OF THE PARCEL OF LAND SHOWN ON THIS MAP. THAT THE SURVEY WAS CONDUCTED USING GENERALLY ACCEPTED SURVEYING PRACTICES. IT DOES NOT PURPORT TO SHOW ALL EASEMENTS OF RECORD, NOR IS IT PROOF OF OWNERSHIP.

ROBERT O. BAKER
UTAH REGISTERED LAND SURVEYOR
LICENSE NO. 172816

REVISIONS			
No.	DATE	BY	REVISION

DRAWN BY: HU
DESIGN BY: HU
CHECKED BY: ROB
DATE: 12-10-05

CLIENT: PARSONS
DWG: MONITOR WELL-2004.dwg
JOB No: PARSON 04
DRAWING IS REDUCED IF LESS THAN 22"x34"
DIMENSIONS AND NOTES TAKE PRECEDENCE OVER SCALE.

Ward Engineering Group
Planning • Engineering • Surveying

Salt Lake City Office
1370 S. West Temple
Salt Lake City, Utah 84115

tel (801) 487-8048
fax (801) 487-8668

LOCATED IN PARTS OF SECTION 7, 17, 19, 20, and 30
TOWNSHIP 3 SOUTH, RANGE 4 WEST,
SALT LAKE BASE AND MERIDIAN,
TOOELE, UTAH.

RECORD OF SURVEY

SHEET:
1 OF 1

Legal Description – Monitor Well No. C-41

A fifty foot diameter well easement for the purpose of accessing monitor well No. C-41, the center point of which is described as follows:

Commencing at the North Quarter corner of Section 30, Township 3 South, Range 4 West, Salt Lake Base and Meridian; and running thence; thence North $89^{\circ}40'33''$ East along the north line of the Northeast Quarter of said Section 30, a distance of 177.34 feet; thence South $00^{\circ}19'27''$ East, a distance of 174.07 feet to the center point of a PVC pipe marking Monitor Well No. C-41, and point of terminus.

APPENDIX E



**TOOELE ARMY DEPOT
MONITORING WELL SAMPLING DATA**

Well ID: <u>C-41</u>	Initial Depth to Water: <u>338.76</u>
Sample ID:	Total Depth of Well: <u>378.50</u>
Duplicate ID:	Well Diameter: <u>4"</u>
Sample Depth:	(a) 1 Casing Volume:
Date: <u>11/9/04</u>	(b) 1 Filter Pack Water Volume:
Sampled By: <u>JMA</u>	(a) + (b) x 3 = Minimum Volume to Purge:
Method of Sampling: <u>Development S.S. Bailer</u>	Method of Purging: <u>Development S.S. Bailer</u>

Time	Intake depth	Rate (gpm)	Cum. vol. (gal)	Temp (°F)	pH (units)	Conductivity (µS/cm)	Turbidity (NTUs)	TDS (g/L)	DO (mg/L)	ORP (mv)	Salinity (ppt)	Color & Sediment
0914	1st	Bailer*	3	52.9	7.29	71000 ⁸⁵⁵	>1000					Light Tan Fine
0957	10th	Bailer	30	53.8	7.41	842	>1000					Light Tan Fine
1046	20th	Bailer	60	56.2	6.81	854	>1000					Light Tan Fine
1050	Surging well	w/ surge	Black	7.35								
1143	30th	Bailer	90	54.9	7.35	736	>1000					Light Tan Fine
1145	Surging well w/	surge	Black	53.6	7.35							
1232	35th	Bailer	105	53.6	7.39	732	>1000					Light Tan none
3:18												

pH Calibration (select two)				Conductivity Meter Calibration		Turbidimeter Calibration	
Buffer solution	pH 4.0	pH 7.0	pH 10.0	Solution	991	Standard	5.39
Instrument reading		7.0	10.0	Instrument reading	991	Instrument reading	5.39
		0844	0848		0851		0840

Notes: *Bailer Holds 3 gal



**TOOELE ARMY DEPOT
MONITORING WELL SAMPLING DATA**

Well ID: <u>C-41</u>	Initial Depth to Water: <u>338.76</u>
Sample ID:	Total Depth of Well: <u>378.50</u>
Duplicate ID:	Well Diameter: <u>4"</u>
Sample Depth:	(a) 1 Casing Volume: <u>26 gal</u>
Date: <u>11/9/04</u>	(b) 1 Filter Pack Water Volume:
Sampled By: <u>MD</u>	(a) + (b) x 3 = Minimum Volume to Purge: <u>78 gal</u>
Method of Sampling: <u>Development + 4" submersible</u>	Method of Purging: <u>Development + 4" submersible</u>

Time	Intake depth	Rate (gpm)	Cum. vol. (gal)	Temp (°F)	pH (units)	Conductivity (µS/cm)	Turbidity (NTUs)	TDS (g/L)	DO (mg/L)	ORP (mv)	Salinity (ppt)	Color & Sediment
1343	377	4.09	0									
1403	377	4.21	80	53.6	7.27	752	69.4					cloudy none
1423	377	4.09	160	53.7	7.28	754	53.0					cloudy none
1443	377	4.23	240	53.8	7.28	752	34.8					clear none
1444	Pump off		Backfl	washed	5x							
1501	Purge meters off		Backfl	washed	53.7	7.30	756	106				cloudy none
1521	377	4.09	320	54.6	7.29	758	16.3					clear none
1524	Pump off		will	continue		Tomorrow						
1:41												

pH Calibration (select two)				Conductivity Meter Calibration		Turbidimeter Calibration	
Buffer solution	pH 4.0	pH 7.0	pH 10.0	Solution		Standard	
Instrument reading				Instrument reading		Instrument reading	

Notes:



**TOOELE ARMY DEPOT
MONITORING WELL SAMPLING DATA**

Well ID: C-41	Initial Depth to Water: 338.76
Sample ID:	Total Depth of Well: 378.50
Duplicate ID:	Well Diameter: 4"
Sample Depth:	(a) 1 Casing Volume: 26 gal
Date: 11/10/04	(b) 1 Filter Pack Water Volume:
Sampled By:	(a) + (b) x 3 = Minimum Volume to Purge: 78 gal
Method of Sampling: Development 4" submersible	Method of Purging: Development 4" submersible

Time	Intake depth	Rate (gpm) <i>0.37</i>	Cum. vol. (gal)	Temp (°F)	pH (units)	Conductivity (µS/cm)	Turbidity (NTUs)	TDS (g/L)	DO (mg/L)	ORP (mv)	Salinity (ppt)	Color & Sediment
0757	377	<i>4.09</i>	320									
0817	377	4.09	400	52.4	7.25	949	1.34					Clear none
0818	Pump off	Backflushed	5x									
0835	Re-meter	After Backflush		52.2	7.34	968	16.8					Clear none
0855	377	4.21	480	52.0	7.30	961	.98					Clear none
0915	377	4.09	560	52.3	7.34	970	.81					Clear none

pH Calibration (select two)				Conductivity Meter Calibration		Turbidimeter Calibration	
Buffer solution	pH 4.0	pH 7.0	pH 10.0	Solution	991	Standard	5.39
Instrument reading		7.0	10.0	Instrument reading	991	Instrument reading	5.39
		0735	0739		0744		0741

Notes:

Tuesday November 9, 2004

Cloudy, Rain ~ 400

Wind: Breeze from North

0730 Arrive at Parsons Field office, picked up decon water at Hydrant

0800 Arrive at C-41 and Start Set up
SWL 338.76 TD 378.50

0839 Calibrated Equipment

0914 1st Bailer removed, Parameters Taken

0957 10th Bailer removed, Parameters Taken

1046 20th Bailer removed, Parameters Taken

1050 Surging well w/surge block

1143 30th Bailer Removed, Parameters Taken

1145 Surging well w/surge block

1232 35th Bailer Removed, Parameters Taken

1241 Lowering pump and piping

1341 Pump on, establishing Flow

1342 Conducting draw down Testing

1343 Flow established at 4 gpm, Intake 377

1444 Pump off, Backflushed well 5x

1524 Pump off, completing recovery portion of draw down test. Well Resume pumping

Tomorrow

1539 Recovery Test Complete

1543 Decon Equipment

1627 Leaving C-41 → 90 day yard

1633 Arrive at 90 day yard offloading ~400 gal
JH ~350 gal of Development water

Wednesday November 10, 2004

Clear, Cool ~ 40°

Wind: Breeze from South

0716 Arrive at C-41 and start Setup

0730 Calibrated Equipment

0755 Pump on, establishing flow

0757 Flow established at 4 gpm, Intake

0818 Pump off, Backflushed well 5x

0915 Final Parameters Taken. Parameters stable
and NTU's are below 5, Matt Ivers (Kleinfelder)
on-site to verify Pump off.

Cleaning and Storing Equipment

1117 Removing pump and piping

1204 Decon Equipment

1330 Leaving C-41 → 90 day yard

1339 Arrive at 90 day yard off loading
~300 gal of Development water

APPENDIX F

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Monday December 20, 2004

Weather: Fog, Cold ~ 30°

Wind: None

- 1023 Arrive at C-44 and installing 3 samplers
at 283', 293' and 303'. SWL 262.08'
- 1057 Leaving C-44 → C-43
- 1108 Arrive at C-43 and installing 3 samplers
at 319', 329' and 339'. SWL 293.59'
- 1128 Leaving C-43 → C-42
- 1141 Arrive at C-42 and installing 4 samplers
at 340', (2) 350' (ms/mso) and 360'. SWL 318.92'
- 1208 Leaving C-42 → C-41
- Arrive at C-41 and installing 4 samplers
- 1214 at (2) 358' (Duplicates), 368 and 378'. SWL 337.86'

Monday January 3, 2005

Weather: Cloudy, Cool ~ 40°

Wind: None

0902 Arrive at C-41 and preparing to Sample

0928 Removing Samplers

12 VOA'S Taken, 40 ml w/MCL

0934 (3) C-41GW001 (358')

(1000) (3) C-41FD001 (358')

0946 (3) C-41GW002 (368')

0952 (3) C-41GW003 (378')

1005 Leaving C-41 → C-42

1008 Arrive at C-42 and preparing to Sample

1033 Removing Samplers

15 VOA'S Taken, 40 ml w/MCL

1036 (3) C-42F-GW001 (340')

1042 (3) C-42F-GW002 (350')

1042 (3) C-42F-GW002 (350')

1042 (3) C-42F-SD002 (350')

1052 (3) C-42F-GW003 (360')

1109 Leaving at C-42F → C-43F

1112 Arrive at C-43F and preparing to Sample

1132 Removing Samplers

11 VOA'S Taken, 40 ml w/MCL

1137 (3) C-43FGW001 (319')

1137 (2) C-43FFR001 (319')

1144 (3) C-43FGW002 (329')

1150 (3) C-43FGW003 (339')

1209 Leaving C-43F → C-44

1220 Arrive at C-44 and preparing to Sample

1234 Removing Samplers

39 VOA'S Taken, 40 ml w/MCL

1238 (3) C-44GW001 (283')

1243 (3) C-44GW002 (293')

62

Cont 1/3/05

1248 (3) C-44 GW003 (303')

1258 Leaving C-44 → Parson's field office

1311 Arrive at Field office, delivered samples
spoke w/ Jeff Bigelow and confirmed receipt
of samples.

ANALYTICAL QUALITY CONTROL SUMMARY

Samples were collected in accordance with the analytical and quality control specifications of the Final Phase II RCRA Facility Investigation SWMU-58 Work Plan (Parsons, 2003). Passive diffusion bag samplers were deployed in wells C-41, C-42, C-43, and C-44 on the same day. Samples (including field quality control samples) were collected on the 3rd of January 2005 and submitted to Ecology and Environment Analytical Service Center, a Utah and USACE-certified analytical laboratory.

Results were received and submitted to third party data review by Synectics. Data review included checks of the following data quality elements: Holding times, continuing calibration verification, method blanks, field blanks, laboratory control sample recovery, matrix spike and matrix spike duplicate recovery and precision, surrogate recovery, and field duplicate precision. No out of control events warranting qualification of the data were observed. Analytical and data validation reports are attached.



analytical services center

International Specialists in Environmental Analysis

4493 Walden Avenue, Lancaster, New York 14086

Tel: 716/685-8080, 800/327-6534 • Fax: 716/685-0852 • Email: asc@ene.com



January 14, 2005

Jan Barbas
Parsons Engineering Science, Inc.
406 W. South Jordan Pkwy.
Suite 300
South Jordan, Utah 840953944

RE: Tooele RCRA Phase II
Work Order No.: **0501021**

Dear Jan Barbas,

Analytical Services Center received 14 samples on Tuesday, January 04, 2005 for the analyses presented in the following report.

The ASC certifies that the test results in this report meet all requirements of NELAC for which it holds certification except as noted in this narrative and/or as flagged in the report.

The ASC is accredited in the Fields of Testing Potable water (SDWA), Solid and Chemical Materials (Solid Hazardous Wastes, RCRA), Water (CWA and other non-potable water) and Air and Emissions. Its primary accrediting authorities are New York State Department of Health and Florida Department of Health. The particular analytes/methods certified may be ascertained by requesting the laboratory's current certificates from your laboratory Project Manager.

You will receive an invoice under separate cover.

E & E will retain the samples addressed in this report for 30 days, unless otherwise instructed by the client. If additional storage is requested, the storage fee is \$1.00 per sample container per month, to accrue until the client authorizes sample destruction.

This report is not to be reproduced, except in full, without the written approval of the laboratory.

Sincerely,

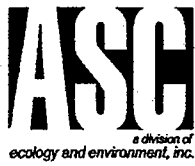

Tony Bogolin

Project Manager

CC:

Enclosures as noted

This report ends on page 340



Analytical Services Center
International Specialists in Environmental Analysis
Lancaster, New York 14086-
Phone: (716) 685-8080 Fax: (716) 685-0852

Laboratory Results

NYS ELAP ID#: 10486

CLIENT: Parsons Engineering Science, Inc.
Project: Tooele RCRA Phase II
Lab Order: 0501021
Date Received: 1/4/2005

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Alt. Client Id	Collection Date
0501021-01A	PARSTB1		1/3/2005 7:55:00 AM
0501021-02A	C-41GW001		1/3/2005 9:34:00 AM
0501021-03A	C-41FD001		1/3/2005 10:00:00 AM
0501021-04A	C-41GW002		1/3/2005 9:46:00 AM
0501021-05A	C-41GW003		1/3/2005 9:52:00 AM
0501021-06A	C-42GW001		1/3/2005 10:36:00 AM
0501021-07A	C-42GW002		1/3/2005 10:42:00 AM
0501021-08A	C-42GW003		1/3/2005 10:52:00 AM
0501021-09A	C-43GW001		1/3/2005 11:37:00 AM
0501021-10A	C-43GW002		1/3/2005 11:44:00 AM
0501021-11A	C-43GW003		1/3/2005 11:50:00 AM
0501021-12A	C-44GW001		1/3/2005 12:38:00 PM
0501021-13A	C-44GW002		1/3/2005 12:43:00 PM
0501021-14A	C-44GW003		1/3/2005 12:48:00 PM



Analytical Services Center

International Specialists in Environmental Analysis

4493 Walden Avenue

Lancaster, New York 14086

Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Client: PARSONS ENGINEERING SCIENCE, INC.
Project: Tooele RCRA Phase II
Lab Order: 0501021

CASE NARRATIVE

GCMS VOLATILES

A DB 624 column and a trap packed with OV-1, Tenax, silica gel and activated charcoal was used for the volatile analysis.

Sample Analysis

All aqueous volatile samples were determined to be at a pH of 1.

All samples were analyzed within hold time.

Samples C-42GW001, C-42GW002, C-42GW003, C-43GW001, C-43GW002 and C-43GW003 were analyzed at secondary dilutions due to the elevated level of trichloroethene present. The diluted sample results have been reported with the original undiluted analysis. Raw data has been included for each analysis.

Calibration and Tunes

All initial and continuing calibrations were acceptable.

There were no manual integrations required.

QC

All surrogate recoveries were within acceptable limits.

All blank analyses were acceptable.

All matrix spike/spike duplicate (MS/MSD) recoveries and RPD values were acceptable.

All laboratory control sample (LCS) recoveries were acceptable.

All internal standard area responses were acceptable.

Tony Bogolin
Project Manager
January 14, 2005



Analytical Services Center
International Specialists in Environmental Analysis
Lancaster, New York 14086-
Phone: (716) 685-8080 Fax: (716) 685-0852

Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Lab Order: 0501021
Client: Parsons Engineering Science, Inc.
Project: Tooele RCRA Phase II

DATES SUMMARY REPORT

(LAB) Sample ID (CLIENT)	Matrix	Test Name	Collection Date	Received Date	HT (Days) / HT Expire	Analyzed* - Analysis/BatchID	Type	DF	#Analytes	Fl
0501021-03A C-41FD001	Water	Low Level VOCs by Method 8260B	1/3/2005 10:00:00 AM	1/4/2005 8:35:00 AM	14:C 1/17/2005 10:00:00 AM	1/6/2005 1:55:00 AM 1089548	SAMP	1	21	[
0501021-02A C-41GW001	Water	Low Level VOCs by Method 8260B	1/3/2005 9:34:00 AM	1/4/2005 8:35:00 AM	14:C 1/17/2005 9:34:00 AM	1/6/2005 1:23:00 AM 1089547	SAMP	1	21	[
0501021-04A C-41GW002	Water	Low Level VOCs by Method 8260B	1/3/2005 9:46:00 AM	1/4/2005 8:35:00 AM	14:C 1/17/2005 9:46:00 AM	1/6/2005 2:27:00 AM 1089549	SAMP	1	21	[
0501021-05A C-41GW003	Water	Low Level VOCs by Method 8260B	1/3/2005 9:52:00 AM	1/4/2005 8:35:00 AM	14:C 1/17/2005 9:52:00 AM	1/6/2005 2:59:00 AM 1089550	SAMP	1	21	[
0501021-06A C-42GW001	Water	Low Level VOCs by Method 8260B	1/3/2005 10:36:00 AM	1/4/2005 8:35:00 AM	14:C 1/17/2005 10:36:00 AM	1/6/2005 3:30:00 AM 1089551	SAMP	1	20	[
		Low Level VOCs by Method 8260B			14:C 1/17/2005 10:36:00 AM	1/7/2005 1:20:00 PM 1090698	SAMP	25	1	[
0501021-07A C-42GW002	Water	Low Level VOCs by Method 8260B	1/3/2005 10:42:00 AM	1/4/2005 8:35:00 AM	14:C 1/17/2005 10:42:00 AM	1/6/2005 4:34:00 AM 1089553	SAMP	1	20	[
		Low Level VOCs by Method 8260B			14:C 1/17/2005 10:42:00 AM	1/7/2005 1:52:00 PM 1090699	SAMP	25	1	[
0501021-08A C-42GW003	Water	Low Level VOCs by Method 8260B	1/3/2005 10:52:00 AM	1/4/2005 8:35:00 AM	14:C 1/17/2005 10:52:00 AM	1/7/2005 3:58:00 PM 1090702	SAMP	25	1	[
		Low Level VOCs by Method 8260B			14:C 1/17/2005 10:52:00 AM	1/6/2005 4:02:00 AM 1089552	SAMP	1	20	[
0501021-09A C-43GW001	Water	Low Level VOCs by Method 8260B	1/3/2005 11:37:00 AM	1/4/2005 8:35:00 AM	14:C 1/17/2005 11:37:00 AM	1/10/2005 4:29:00 PM 1089962	SAMP	4	1	[
		Low Level VOCs by Method 8260B			14:C 1/17/2005 11:37:00 AM	1/7/2005 4:30:00 PM 1090703	SAMP	1	20	[
0501021-10A C-43GW002	Water	Low Level VOCs by Method 8260B	1/3/2005 11:44:00 AM	1/4/2005 8:35:00 AM	14:C 1/17/2005 11:44:00 AM	1/7/2005 5:02:00 PM 1090704	SAMP	1	20	[

HT From: C-Collection / R- Recelpt(VTSR) / P-Prep / T-TCLP Prep

* "Analyzed" reflects the analysis date and time or injection time for analytical tests. For preparation tests "Analyzed" reflects the start of the preparation except when "AFCEE criteria used"; flag indicates date and time of completion of the preparation.

For TCLP/SPLP Extractions and subsequent preparation tests... "Analyzed" reflects the date of TCLP/SPLP Extraction/preparation. For Re-extracted (RE) samples: Preparation tests completed dates reflects the extraction from the original sample leachate unless an "RE" Sample exists for the extraction (tumble) test.



Analytical Services Center

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Lancaster, New York 14086-

Phone: (716) 685-8080 Fax: (716) 685-0852

Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Lab Order: 0501021
Client: Parsons Engineering Science, Inc.
Project: Tooele RCRA Phase II

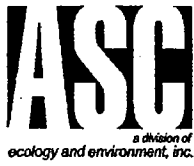
DATES SUMMARY REPORT

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0501021-10A C-43GW002	Water	Low Level VOCs by Method 8260B	1/3/2005 11:44:00 AM	1/4/2005 8:35:00 AM	14:C 1/17/2005 11:44:00 AM	1/10/2005 5:01:00 PM 1089963	SAMP	4	1	[
(LAB) Sample ID (CLIENT)	Matrix	Test Name	Collection Date	Received Date	HT (Days) / HT Expire	Analized* - Analysis/BatchID	Type	DF	#Analytes	FI
0501021-11A C-43GW003	Water	Low Level VOCs by Method 8260B	1/3/2005 11:50:00 AM	1/4/2005 8:35:00 AM	14:C 1/17/2005 11:50:00 AM	1/7/2005 5:34:00 PM 1090705	SAMP	1	20	[
		Low Level VOCs by Method 8260B			14:C 1/17/2005 11:50:00 AM	1/10/2005 5:32:00 PM 1089960	SAMP	4	1	[
(LAB) Sample ID (CLIENT)	Matrix	Test Name	Collection Date	Received Date	HT (Days) / HT Expire	Analized* - Analysis/BatchID	Type	DF	#Analytes	FI
0501021-12A C-44GW001	Water	Low Level VOCs by Method 8260B	1/3/2005 12:38:00 PM	1/4/2005 8:35:00 AM	14:C 1/17/2005 12:38:00 PM	1/7/2005 6:06:00 PM 1090696	SAMP	1	21	[
(LAB) Sample ID (CLIENT)	Matrix	Test Name	Collection Date	Received Date	HT (Days) / HT Expire	Analized* - Analysis/BatchID	Type	DF	#Analytes	FI
0501021-13A C-44GW002	Water	Low Level VOCs by Method 8260B	1/3/2005 12:43:00 PM	1/4/2005 8:35:00 AM	14:C 1/17/2005 12:43:00 PM	1/11/2005 9:55:00 AM 1090824	SAMP	1	21	[
(LAB) Sample ID (CLIENT)	Matrix	Test Name	Collection Date	Received Date	HT (Days) / HT Expire	Analized* - Analysis/BatchID	Type	DF	#Analytes	FI
0501021-14A C-44GW003	Water	Low Level VOCs by Method 8260B	1/3/2005 12:48:00 PM	1/4/2005 8:35:00 AM	14:C 1/17/2005 12:48:00 PM	1/11/2005 10:26:00 AM 1090822	SAMP	1	21	[
(LAB) Sample ID (CLIENT)	Matrix	Test Name	Collection Date	Received Date	HT (Days) / HT Expire	Analized* - Analysis/BatchID	Type	DF	#Analytes	FI
0501021-01A PARSTB1	Water	Low Level VOCs by Method 8260B	1/3/2005 7:55:00 AM	1/4/2005 8:35:00 AM	14:C 1/17/2005 7:55:00 AM	1/5/2005 11:16:00 PM 1089546	SAMP	1	21	[

HT From: C-Collection / R- Receipt(VTSR) / P-Prep / T-TCLP Prep

* "Analized" reflects the analysis date and time or injection time for analytical tests. For preparation tests "Analized" reflects the start of the preparation except when "AFCEE criteria used"; flag indicates date and time of completion of the preparation.

For TCLP/SPLP Extractions and subsequent preparation tests..."Analized" reflects the date of TCLP/SPLP Extraction/preparation. For Re-extracted (RE) samples: Preparation tests completed dates reflects the extraction from the original sample leachate unless an "RE" Sample exists for the extraction (tumble) test.



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Lancaster, New York 14086-
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Laboratory Results

NYS ELAP ID#: 10486

Client: Parsons Engineering Science, Inc.
Project: Tooele RCRA Phase II
Work Order: 0501021

Method References

GCMS Volatiles

Parsons, Tooele - VOCs, Low Level by GCMS Method
8260B

Test Methods for Evaluating Solid Waste: Physical/Chemical
Methods. 3rd ed. 1986. Volumes 1A, 1B, 1C & Volume 2. (Includes
all Updates). U.S. Environmental Protection Agency, Office of Solid
Waste and Emergency Response.

SAMPLE RECEIPT RECORDS

CHAIN OF CUSTODY

PARSONS

COC ID: 840

Project Name: Tooele Industrial Area

Contractor: Parsons - SLC

Parsons Point of Contact: Jan Barbas

Project Manager: Ed Staes

Installation: TEAD

406 W. South Jordan Parkway

Sample Coordinator: Jeff Bigelow

Sample Program: Shallow Soil Sampling

Suite 300
South Jordan, Utah 84095
(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
	FIELDQC	PARSTB1	WQ	NA	TB	1	1/3/05	0755	JBA			3
	Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		ECEN										

8

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
J. Harman	1/3/05 13:17	[Signature]	1/3/05 13:17
[Signature]	1/3/05 15:30	TO FIELD EX	
		with 1/1/05	1-4-05/0835

CHAIN OF CUSTODY PARSONS COC ID: 830	Project Name:	Tooele Industrial Area	Contractor:	Parsons - SLC	Parsons Point of Contact: Jan Barbas
	Project Manager:	Ed Staes	Installation:	TEAD	406 W. South Jordan Parkway
	Sample Coordinator:	Jeff Bigelow	Sample Program:	Shallow Soil Sampling	Suite 300 South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
C-41	C-41	C-41GW001	WG	DF	N	1	1/3/05	0934	JNA	358'	358'	3
Analysis		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		ECEN										

6

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
<i>Jeff Hammer</i>	1/3/05 1317	<i>[Signature]</i>	1/3/05 1217
<i>[Signature]</i>	1/3/05 TO FedEx 1530	<i>[Signature]</i>	1-4-05 1025

CHAIN OF CUSTODY

PARSONS

COC ID: 831

Project Name: Tooele Industrial Area

Contractor: Parsons - SLC

Parsons Point of Contact: Jan Barbas
406 W. South Jordan Parkway

Project Manager: Ed Staes

Installation: TEAD

Suite 300
South Jordan, Utah 84095

Sample Coordinator: Jeff Bigelow

Sample Program: Shallow Soil Sampling

(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
C-41	C-41	C-41FD001	WG	DF	FD	1	1/3/05	1000	JNT	358'	358'	3
Analysis		Lab	Cooler	No. Conts.	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		ECEN										

Relinquished by (Signature)

Date/Time

Received by (Signature)

Date/Time

Jeff Hammer

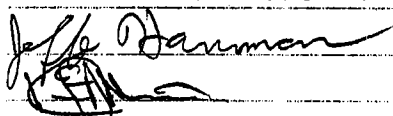
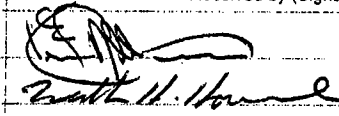
1/3/05 1317
1/3/05 1530 TO FAD EX

JEAN
1/3/05 1530

1/3/05 1317
1-4-05 / 0835

CHAIN OF CUSTODY PARSONS COC ID: 832	Project Name:	Tooele Industrial Area	Contractor:	Parsons - SLC	Parsons Point of Contact: Jan Barbas 406 W. South Jordan Parkway
	Project Manager:	Ed Staes	Installation:	TEAD	Suite 300 South Jordan, Utah 84095
	Sample Coordinator:	Jeff Bigelow	Sample Program:	Shallow Soil Sampling	(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
C-41	C-41	C-41GW002	WG	DF	N	1	1/3/05	0946	JNT	368'	368'	3
Analysis:		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		ECEN										

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
 Jeff Bigelow	1/3/05 1317 TO FND EX 1/3/05 1530	 Jeff Bigelow	1/3/05 1317 1-4-05/0835

CHAIN OF CUSTODY

PARSONS

COC ID: 833

Project Name: Tooele Industrial Area

Contractor: Parsons - SLC

Parsons Point of Contact: Jan Barbas
406 W. South Jordan Parkway

Project Manager: Ed Staes

Installation: TEAD

Suite 300
South Jordan, Utah 84095

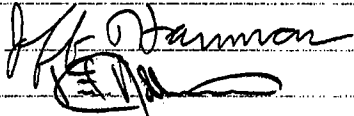

Sample Coordinator: Jeff Bigelow

Sample Program: Shallow Soil Sampling

(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
C-41	C-41	C-41GW003	WG	DF	N	1	1/3/05	0952	JGA	378'	378'	3
Analysis:		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		ECEN										

12

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
	1/3/05 1317 TO FED EX 1/3/05 1530	 William H. Harrell	1/3/05 1317 1-4-05/0835

CHAIN OF CUSTODY PARSONS COC ID: 834	Project Name:	Tooele Industrial Area	Contractor:	Parsons - SLC	Parsons Point of Contact: Jan Barbas
	Project Manager:	Ed Staes	Installation:	TEAD	406 W. South Jordan Parkway
	Sample Coordinator:	Jeff Bigelow	Sample Program:	Shallow Soil Sampling	Suite 300 South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
C-42	C-42	C-42GW001	WG	DF	N	1	1/3/05	1030	JMA	340'	340'	3
Analysis		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		ECEN										

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
<i>[Signature]</i>	1/3/05 1317	<i>[Signature]</i>	1/3/05 1317
<i>[Signature]</i>	1/3/05 1530 Ex	<i>[Signature]</i>	1-4-05/0835

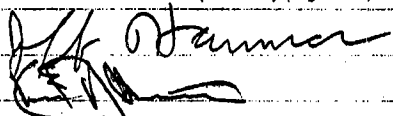
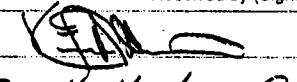
CHAIN OF CUSTODY PARSONS COC ID: 835	Project Name:	Tooele Industrial Area	Contractor:	Parsons - SLC	Parsons Point of Contact: Jan Barbas
	Project Manager:	Ed Staes	Installation:	TEAD	Suite 300
	Sample Coordinator:	Jeff Bigelow	Sample Program:	Shallow Soil Sampling	South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Bag Depth	End. Depth	Total Conts.
C-42	C-42	C-42GW002	WG	DF	N	1	1/3/05	1642	JNT	350'	350'	3
Analysis		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		ECEN										

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
<i>[Signature]</i>	1/3/05 1317	<i>[Signature]</i>	1/3/05 1317
	1/3/05 TO RAD EX 1530	<i>[Signature]</i>	1-4-05 / 0835

CHAIN OF CUSTODY PARSONS COC ID: 836	Project Name:	Tooele Industrial Area	Contractor:	Parsons - SLC	Parsons Point of Contact: Jan Barbas
	Project Manager:	Ed Staes	Installation:	TEAD	Suite 300
	Sample Coordinator:	Jeff Bigelow	Sample Program:	Shallow Soil Sampling	South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
C-42	C-42	C-42MS002	WG	DF	MS	1	1/3/05	1042	JNT	350'	350'	3
Analysis		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		ECEN										

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
	1/3/05 1317		1/3/05 1317
	TO F&D EX 1/3/05 1530	South H. Hammer	1-4-05/0835

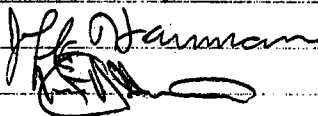


CHAIN OF CUSTODY PARSONS COC ID: 837	Project Name:	Tooele Industrial Area	Contractor:	Parsons - SLC	Parsons Point of Contact: Jan Barbas
	Project Manager:	Ed Staes	Installation:	TEAD	Suite 300
	Sample Coordinator:	Jeff Bigelow	Sample Program:	Shallow Soil Sampling	South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
C-42	C-42	C-42SD002	WG	DF	SD	1	1/3/05	1042	JTB	350'	350'	3
Analysis		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		ECEN										

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
Jeff Dammann	1/3/05 1317	[Signature]	1/3/05 1317
	1/3/05 TO FAD EX 1530	with H. [Signature]	1-4-05/0825

CHAIN OF CUSTODY PARSONS COC ID: 838	Project Name:	Tooele Industrial Area	Contractor:	Parsons - SLC	Parsons Point of Contact: Jan Barbas
	Project Manager:	Ed Staes	Installation:	TEAD	Suite 300
	Sample Coordinator:	Jeff Bigelow	Sample Program:	Shallow Soil Sampling	South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
C-42	C-42	C-42GW003	WG	DF	N	1	1/3/05	1052	JTA	360'	360'	3
Analysis:		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		ECEN										

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
	1/3/05 1317		1/3/05 1317
	1/3/05 TO FPD EX 15:50		1-4-05 10:55

CHAIN OF CUSTODY

PARSONS

COC ID: 914

Project Name: Tooele Industrial Area

Contractor: Parsons - SLC

Parsons Point of Contact: Jan Barbas
406 W. South Jordan Parkway

Project Manager: Ed Staes

Installation: TEAD

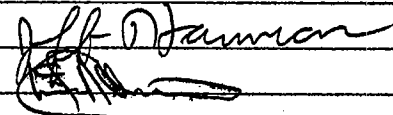
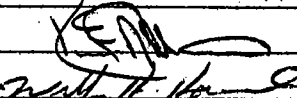
Suite 300
South Jordan, Utah 84095

Sample Coordinator: Jeff Bigelow

Sample Program: Shallow Soil Sampling

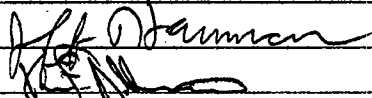
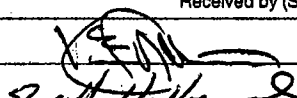
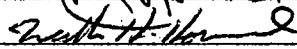
(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Log Depth	End Depth	Total Counts
C-43	C-43	C-43GW001	WG	DF	N	1	1/3/05	1137	JBA	319'	319'	3
Analysis	Lab	Cooler	No. Counts	AB Lot	EB Lot	TB Lot	Remarks:					
VOC	ECEN											

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
	1/3/05 1317 13/05 TO FPD EX 1530		1/3/05 1317 1-405/0835

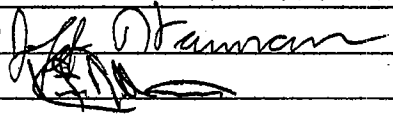

CHAIN OF CUSTODY PARSONS COC ID: 915	Project Name:	Tooele Industrial Area	Contractor:	Parsons - SLC	Parsons Point of Contact: Jan Barbas
	Project Manager:	Ed Staes	Installation:	TEAD	Suite 300
	Sample Coordinator:	Jeff Bigelow	Sample Program:	Shallow Soil Sampling	South Jordan, Utah 84095
					(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Bag Depth	End Depth	Total Cnts
C-43	C-43	C-43GW002	WG	DF	N	1	11/3/05	1144	JPA	329'	329'	3
Analysis		Lab	Cooler	No. Cnts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		ECEN										

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
	11/3/05 1317		11/3/05 1317
	11/3/05 TO F&D EX 1530		11-4-05 1625

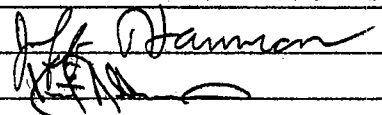
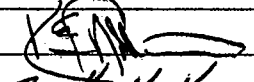

CHAIN OF CUSTODY PARSONS COC ID: 916	Project Name:	Tooele Industrial Area	Contractor:	Parsons - SLC	Parsons Point of Contact: Jan Barbas 406 W. South Jordan Parkway Suite 300 South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069
	Project Manager:	Ed Staes	Installation:	TEAD	
	Sample Coordinator:	Jeff Bigelow	Sample Program:	Shallow Soil Sampling	

Site ID	Location	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Bag Depth	End Depth	Total Count
C-43	C-43	C-43GW003	WG	DF	N	1	1/3/05	1150	JGA	339'	339'	3
Analysis		Lab	Cooler	No. Counts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		ECEN										

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
	1/3/05 1317		1/3/05 1317
	1/3/05 TO F&O 1530 Ex	2nd Lt. [Signature]	1-4-05 10435

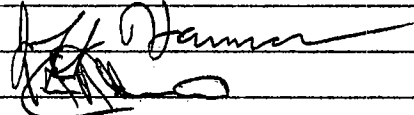
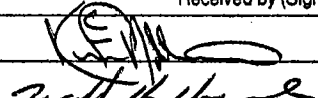

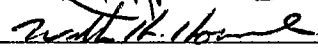
CHAIN OF CUSTODY PARSONS COC ID: 917	Project Name:	Tooele Industrial Area	Contractor:	Parsons - SLC	Parsons Point of Contact: Jan Barbas 406 W. South Jordan Parkway Suite 300 South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069
	Project Manager:	Ed Staes	Installation:	TEAD	
	Sample Coordinator:	Jeff Bigelow	Sample Program:	Shallow Soil Sampling	

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Line	Logged By	Begin Depth	End Depth	Total Counts
C-44	C-44	C-44GW001	WG	DF	N	1	1/3/05	1238	J.A.	283'	283'	3
Analysis		Lab	Copier	No. Counts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		ECEN										

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
	1/3/05 1317		1/3/05 1317
	TO FED EX 1/3/05 1330		1-4-05 1625

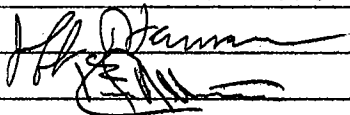

CHAIN OF CUSTODY PARSONS COC ID: 918	Project Name:	Tooele Industrial Area	Contractor:	Parsons - SLC	Parsons Point of Contact: Jan Barbas 406 W. South Jordan Parkway Suite 300 South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069
	Project Manager:	Ed Staes	Installation:	TEAD	
	Sample Coordinator:	Jeff Bigelow	Sample Program:	Shallow Soil Sampling	

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Lab Date	Log Time	Logged By	Bag Depth	End Depth	Total Conts.
C-44	C-44	C-44GW002	WG	DF	N	1	1/3/05	1243	JB	293	293	3
Analysis		Lab	Coalar	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		ECEN										

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
	1/3/05 1317		1/3/05 1317
	1/3/05 TO FAS EX 1330		1-4-05 10835

CHAIN OF CUSTODY PARSONS COC ID: 919	Project Name:	Tooele Industrial Area	Contractor:	Parsons - SLC	Parsons Point of Contact: Jan Barbas
	Project Manager:	Ed Staes	Installation:	TEAD	Suite 300
	Sample Coordinator:	Jeff Bigelow	Sample Program:	Shallow Soil Sampling	South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Begin Depth	End Depth	Total Conts
C-44	C-44	C-44GW003	WG	DF	N	1	11/3/05	1248	JNT	303'	303'	3
Analysis		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		ECEN										

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
	11/3/05 1317		11/3/05 1317
	TO FED EX		1-4-05/0835
	11/3/05 1530		



Cooler Receipt Form

No. of Packages:	1	Date Received:	1-4-05
Package Receipt No.:	15296	Project or Site Name:	
Client:	Parsons		

A. Preliminary Examination and Receipt Phase		Circle One	
1. Did coolers come with airbill or packing slip?		<input checked="" type="radio"/> Yes	No NA
Circle carrier here and print airbill number below: <input checked="" type="radio"/> Fed/Ex Airborne Client Other _____			
Shipped as high hazard or dangerous goods?		Yes	<input checked="" type="radio"/> No NA
2. Did cooler(s) have custody seals?		<input checked="" type="radio"/> Yes	No NA
3. Were custody seals unbroken and intact on receipt?		<input checked="" type="radio"/> Yes	No NA
4. Were custody seals dated and signed?		<input checked="" type="radio"/> Yes	No NA
5. How was package secured? Not secured <input checked="" type="radio"/> Fiberglass Tape _____			

B. Unpacking Phase			
6. Date cooler(s) opened: 1-4-05		Cooler(s) opened by: <u>Matthew H. H. H.</u> (Signature)	
7. Was a temperature blank vial included inside cooler(s)?		<input checked="" type="radio"/> Yes	No NA
Please Record Temperature Vial or Cooler Temperature for Each Cooler, Range (2° - 6°C)*			
Airbill No.	Temp. °C	Airbill No.	Temp. °C
7903 8450 3906	3.5		
Thermometer No.: 231	Correction Factor: 0.0	*If temperature is outside of acceptable range, prepare a PM Notification form indicating affected containers.	
8. Were the C-O-C forms received?		<input checked="" type="radio"/> Yes	No NA
C-O-C forms numbers if present:			
9. Was enough packing material used in cooler(s)?		Yes	No NA
Type of material: <input type="checkbox"/> Vermiculite <input checked="" type="checkbox"/> Bubble Wrap <input type="checkbox"/> Other _____			
10. If cooling was required, what was the means (type ice) of cooling used: <input checked="" type="checkbox"/> Wet <input type="checkbox"/> Dry <input type="checkbox"/> Blue <input type="checkbox"/> Other			NA
11. Were all containers sealed in separate plastic bags?		<input checked="" type="radio"/> Yes	No NA
12. Did all containers arrive unbroken and in good condition?		<input checked="" type="radio"/> Yes	No NA
13. Interim storage area if not logged: _____			
In: Date _____ Time _____	Signature _____		
Out: Date _____ Time _____	Signature _____		

C. Login Phase	
Samples Logged in By Signature: <u>McQuay</u>	Date: 1/4/05
14. Were all container labels complete (e.g. date, time preserved)?	<input checked="" type="radio"/> Yes No NA
15. Were all C-O-C forms filled out properly in black ink and signed?	<input checked="" type="radio"/> Yes No NA
16. Did the C-O-C form agree with containers received?	<input checked="" type="radio"/> Yes No NA
17. Were the correct containers used for the tests requested?	<input checked="" type="radio"/> Yes No NA
18. Were the correct preservatives listed on the sample labels?	<input checked="" type="radio"/> Yes No NA
19. Was a sufficient sample volume sent for the tests requested?	<input checked="" type="radio"/> Yes No NA
20. Were all volatile samples received without headspace?	<input checked="" type="radio"/> Yes No NA

RESULTS SUMMARY



Analytical Services Center
International Specialists in Environmental Analysis
4493 Walden Avenue
Lancaster, New York 14086

Laboratory Results

NYS ELAP ID#: 10486
Phone: (716) 685-8080

Client: Parsons Engineering Science, Inc.

Client Sample ID: PARSTB1

Lab Order: 0501021

Alt. Client ID:

Project: Tooele RCRA Phase II

Collection Date: 1/3/2005 7:55:00 AM % Moist:

Lab ID: 0501021-01A

Sample Type: SAMP

Matrix: Water

Test Code: C_8260B_5030B_LL_W_018

LOW LEVEL VOCs BY METHOD 8260B

Method: SW8260B

Prep Method: SW5030B_LL

Analyte	Result	Q	RL	Units	DF	Date Analyzed	Run Batch ID	Analyst
1,1,1-Trichloroethane	ND		1.00	µg/L	1	1/5/2005 11:16:00 PM	LINUS_050105E	GP
1,1,2-Trichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethene	ND		1.00	µg/L	1			
1,2-Dichloroethane	ND		1.00	µg/L	1			
1,2-Dichloropropane	ND		1.00	µg/L	1			
Benzene	ND		1.00	µg/L	1			
Carbon tetrachloride	ND		1.00	µg/L	1			
Chloroethane	ND		1.00	µg/L	1			
Chloroform	ND		1.00	µg/L	1			
cis-1,2-Dichloroethene	ND		1.00	µg/L	1			
Ethylbenzene	ND		1.00	µg/L	1			
m,p-Xylene	ND		1.00	µg/L	1			
Methylene chloride	ND		2.00	µg/L	1			
Naphthalene	ND		1.00	µg/L	1			
o-Xylene	ND		1.00	µg/L	1			
Tetrachloroethene	ND		1.00	µg/L	1			
Toluene	ND		1.00	µg/L	1			
trans-1,2-Dichloroethene	ND		1.00	µg/L	1			
Trichloroethene	ND		1.00	µg/L	1			
Vinyl chloride	ND		1.00	µg/L	1			
Surr:1,2-Dichloroethane-d4	93		70 - 130	%REC	1	1/5/2005 11:16:00 PM	LINUS_050105E	GP
Surr:4-Bromofluorobenzene	96		70 - 130	%REC	1			
Surr:Toluene-d8	91		70 - 130	%REC	1			

Definitions:

* - Recovery outside QC limits

DF - Dilution Factor

H - Value Exceeds Maximum Contaminant Level

N - Single Column Analysis

NP - Petroleum Pattern is not present

B - Analyte found in Method blank

DNI - Did not Ignite

J - Estimated value

NC - Not Calculated

P - Post Spike Recovery outside limits

D - Diluted due to matrix or extended target compounds

E - Result above quantitation limit (high standard or ICP linear range).

M - Matrix Spike Recovery outside limits

ND - Not Detected at the Reporting Limit

R - RPD outside recovery limits

**Analytical Services Center**

International Specialists in Environmental Analysis

4493 Walden Avenue

Lancaster, New York 14086

Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Client: Parsons Engineering Science, Inc.

Client Sample ID: C-41GW001

Lab Order: 0501021

Alt. Client ID:

Project: Tooele RCRA Phase II

Collection Date: 1/3/2005 9:34:00 AM % Moist:

Lab ID: 0501021-02A

Sample Type: SAMP

Matrix: Water

Test Code: C_8260B_5030B_LL_W_018

LOW LEVEL VOCs BY METHOD 8260B

Method: SW8260B

Prep Method: SW5030B_LL

Analyte	Result	Q	RL	Units	DF	Date Analyzed	Run Batch ID	Analyst
1,1,1-Trichloroethane	ND		1.00	µg/L	1	1/6/2005 1:23:00 AM	LINUS_050105E	GP
1,1,2-Trichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethene	ND		1.00	µg/L	1			
1,2-Dichloroethane	ND		1.00	µg/L	1			
1,2-Dichloropropane	ND		1.00	µg/L	1			
Benzene	ND		1.00	µg/L	1			
Carbon tetrachloride	0.229	J	1.00	µg/L	1			
Chloroethane	ND		1.00	µg/L	1			
Chloroform	ND		1.00	µg/L	1			
cis-1,2-Dichloroethene	ND		1.00	µg/L	1			
Ethylbenzene	ND		1.00	µg/L	1			
m,p-Xylene	ND		1.00	µg/L	1			
Methylene chloride	ND		2.00	µg/L	1			
Naphthalene	ND		1.00	µg/L	1			
o-Xylene	ND		1.00	µg/L	1			
Tetrachloroethene	ND		1.00	µg/L	1			
Toluene	ND		1.00	µg/L	1			
trans-1,2-Dichloroethene	ND		1.00	µg/L	1			
Trichloroethene	18.7		1.00	µg/L	1			
Vinyl chloride	ND		1.00	µg/L	1			
Surr:1,2-Dichloroethane-d4	96		70 - 130	%REC	1	1/6/2005 1:23:00 AM	LINUS_050105E	GP
Surr:4-Bromofluorobenzene	97		70 - 130	%REC	1			
Surr:Toluene-d8	93		70 - 130	%REC	1			

Definitions:

* - Recovery outside QC limits

DF - Dilution Factor

H - Value Exceeds Maximum Contaminant Level

N - Single Column Analysis

NP - Petroleum Pattern is not present

B - Analyte found in Method blank

DNI - Did not Ignite

J - Estimated value

NC - Not Calculated

P - Post Spike Recovery outside limits

D - Diluted due to matrix or extended target compounds

E - Result above quantitation limit (high standard or ICP linear range).

M - Matrix Spike Recovery outside limits

ND - Not Detected at the Reporting Limit

R - RPD outside recovery limits

**Analytical Services Center**

International Specialists in Environmental Analysis

4493 Walden Avenue

Lancaster, New York 14086

Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Client: Parsons Engineering Science, Inc.

Client Sample ID: C-41FD001

Lab Order: 0501021

Alt. Client ID:

Project: Tooele RCRA Phase II

Collection Date: 1/3/2005 10:00:00 AM % Moist:

Lab ID: 0501021-03A

Sample Type: SAMP

Matrix: Water

Test Code: C_8260B_5030B_LL_W_018

LOW LEVEL VOCs BY METHOD 8260B

Method: SW8260B

Prep Method: SW5030B_LL

Analyte	Result	Q	RL	Units	DF	Date Analyzed	Run Batch ID	Analyst
1,1,1-Trichloroethane	ND		1.00	µg/L	1	1/6/2005 1:55:00 AM	LINUS_050105E	GP
1,1,2-Trichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethene	ND		1.00	µg/L	1			
1,2-Dichloroethane	ND		1.00	µg/L	1			
1,2-Dichloropropane	ND		1.00	µg/L	1			
Benzene	ND		1.00	µg/L	1			
Carbon tetrachloride	0.251	J	1.00	µg/L	1			
Chloroethane	ND		1.00	µg/L	1			
Chloroform	ND		1.00	µg/L	1			
cis-1,2-Dichloroethene	ND		1.00	µg/L	1			
Ethylbenzene	ND		1.00	µg/L	1			
m,p-Xylene	ND		1.00	µg/L	1			
Methylene chloride	ND		2.00	µg/L	1			
Naphthalene	ND		1.00	µg/L	1			
o-Xylene	ND		1.00	µg/L	1			
Tetrachloroethene	ND		1.00	µg/L	1			
Toluene	ND		1.00	µg/L	1			
trans-1,2-Dichloroethene	ND		1.00	µg/L	1			
Trichloroethene	18.5		1.00	µg/L	1			
Vinyl chloride	ND		1.00	µg/L	1			
Surr:1,2-Dichloroethane-d4	95		70 - 130	%REC	1	1/6/2005 1:55:00 AM	LINUS_050105E	GP
Surr:4-Bromofluorobenzene	96		70 - 130	%REC	1			
Surr:Toluene-d8	94		70 - 130	%REC	1			

Definitions:

* - Recovery outside QC limits

DF - Dilution Factor

H - Value Exceeds Maximum Contaminant Level

N - Single Column Analysis

NP - Petroleum Pattern is not present

B - Analyte found in Method blank

DNI - Did not Ignite

J - Estimated value

NC - Not Calculated

P - Post Spike Recovery outside limits

D - Diluted due to matrix or extended target compounds

E - Result above quantitation limit (high standard or ICP linear range).

M - Matrix Spike Recovery outside limits

ND - Not Detected at the Reporting Limit

R - RPD outside recovery limits

**Analytical Services Center**

International Specialists in Environmental Analysis

4493 Walden Avenue

Lancaster, New York 14086

Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Client: Parsons Engineering Science, Inc.

Client Sample ID: C-41GW002

Lab Order: 0501021

Alt. Client ID:

Project: Tooele RCRA Phase II

Collection Date: 1/3/2005 9:46:00 AM % Moist:

Lab ID: 0501021-04A

Sample Type: SAMP

Matrix: Water

Test Code: C_8260B_5030B_LL_W_018

LOW LEVEL VOCs BY METHOD 8260B

Method: SW8260B

Prep Method: SW5030B_LL

Analyte	Result	Q	RL	Units	DF	Date Analyzed	Run Batch ID	Analyst
1,1,1-Trichloroethane	ND		1.00	µg/L	1	1/6/2005 2:27:00 AM	LINUS_050105E	GP
1,1,2-Trichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethene	ND		1.00	µg/L	1			
1,2-Dichloroethane	ND		1.00	µg/L	1			
1,2-Dichloropropane	ND		1.00	µg/L	1			
Benzene	ND		1.00	µg/L	1			
Carbon tetrachloride	0.237	J	1.00	µg/L	1			
Chloroethane	ND		1.00	µg/L	1			
Chloroform	ND		1.00	µg/L	1			
cis-1,2-Dichloroethene	ND		1.00	µg/L	1			
Ethylbenzene	ND		1.00	µg/L	1			
m,p-Xylene	ND		1.00	µg/L	1			
Methylene chloride	ND		2.00	µg/L	1			
Naphthalene	ND		1.00	µg/L	1			
o-Xylene	ND		1.00	µg/L	1			
Tetrachloroethene	ND		1.00	µg/L	1			
Toluene	ND		1.00	µg/L	1			
trans-1,2-Dichloroethene	ND		1.00	µg/L	1			
Trichloroethene	18.4		1.00	µg/L	1			
Vinyl chloride	ND		1.00	µg/L	1			
Surr:1,2-Dichloroethane-d4	94		70 - 130	%REC	1	1/6/2005 2:27:00 AM	LINUS_050105E	GP
Surr:4-Bromofluorobenzene	97		70 - 130	%REC	1			
Surr:Toluene-d8	93		70 - 130	%REC	1			

Definitions:

* - Recovery outside QC limits

DF - Dilution Factor

H - Value Exceeds Maximum Contaminant Level

N - Single Column Analysis

NP - Petroleum Pattern is not present

B - Analyte found in Method blank

DNI - Did not Ignite

J - Estimated value

NC - Not Calculated

P - Post Spike Recovery outside limits

D - Diluted due to matrix or extended target compounds

E - Result above quantitation limit (high standard or ICP linear range).

M - Matrix Spike Recovery outside limits

ND - Not Detected at the Reporting Limit

R - RPD outside recovery limits

**Analytical Services Center**

International Specialists in Environmental Analysis

4493 Walden Avenue

ecology and environment, inc. Lancaster, New York 14086

Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Client: Parsons Engineering Science, Inc.

Client Sample ID: C-41GW003

Lab Order: 0501021

Alt. Client ID:

Project: Tooele RCRA Phase II

Collection Date: 1/3/2005 9:52:00 AM % Moist:

Lab ID: 0501021-05A

Sample Type: SAMP

Matrix: Water

Test Code: C_8260B_5030B_LL_W_018

LOW LEVEL VOCs BY METHOD 8260B

Method: SW8260B

Prep Method: SW5030B_LL

Analyte	Result	Q	RL	Units	DF	Date Analyzed	Run Batch ID	Analyst
1,1,1-Trichloroethane	ND		1.00	µg/L	1	1/6/2005 2:59:00 AM	LINUS_050105E	GP
1,1,2-Trichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethene	ND		1.00	µg/L	1			
1,2-Dichloroethane	ND		1.00	µg/L	1			
1,2-Dichloropropane	ND		1.00	µg/L	1			
Benzene	ND		1.00	µg/L	1			
Carbon tetrachloride	0.231	J	1.00	µg/L	1			
Chloroethane	ND		1.00	µg/L	1			
Chloroform	ND		1.00	µg/L	1			
cis-1,2-Dichloroethene	ND		1.00	µg/L	1			
Ethylbenzene	ND		1.00	µg/L	1			
m,p-Xylene	ND		1.00	µg/L	1			
Methylene chloride	ND		2.00	µg/L	1			
Naphthalene	ND		1.00	µg/L	1			
o-Xylene	ND		1.00	µg/L	1			
Tetrachloroethene	ND		1.00	µg/L	1			
Toluene	ND		1.00	µg/L	1			
trans-1,2-Dichloroethene	ND		1.00	µg/L	1			
Trichloroethene	15.5		1.00	µg/L	1			
Vinyl chloride	ND		1.00	µg/L	1			
Surr:1,2-Dichloroethane-d4	95		70 - 130	%REC	1	1/6/2005 2:59:00 AM	LINUS_050105E	GP
Surr:4-Bromofluorobenzene	97		70 - 130	%REC	1			
Surr:Toluene-d8	94		70 - 130	%REC	1			

Definitions:

* - Recovery outside QC limits

DF - Dilution Factor

H - Value Exceeds Maximum Contaminant Level

N - Single Column Analysis

NP - Petroleum Pattern is not present

B - Analyte found in Method blank

DNI - Did not Ignite

J - Estimated value

NC - Not Calculated

P - Post Spike Recovery outside limits

D - Diluted due to matrix or extended target compounds

E - Result above quantitation limit (high standard or ICP linear range).

M - Matrix Spike Recovery outside limits

ND - Not Detected at the Reporting Limit

R - RPD outside recovery limits



Analytical Services Center
International Specialists in Environmental Analysis
4493 Walden Avenue
Lancaster, New York 14086

Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Client: Parsons Engineering Science, Inc.

Client Sample ID: C-42GW001

Lab Order: 0501021

Alt. Client ID:

Project: Tooele RCRA Phase II

Collection Date: 1/3/2005 10:36:00 AM % Moist:

Lab ID: 0501021-06A

Sample Type: SAMP

Matrix: Water

Test Code: C_8260B_5030B_LL_W_018

LOW LEVEL VOCS BY METHOD 8260B

Method: SW8260B

Prep Method: SW5030B_LL

Analyte	Result	Q	RL	Units	DF	Date Analyzed	Run Batch ID	Analyst
1,1,1-Trichloroethane	ND		1.00	µg/L	1	1/6/2005 3:30:00 AM	LINUS_050105E	GP
1,1,2-Trichloroethane	0.544	J	1.00	µg/L	1			
1,1-Dichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethene	0.201	J	1.00	µg/L	1			
1,2-Dichloroethane	ND		1.00	µg/L	1			
1,2-Dichloropropane	ND		1.00	µg/L	1			
Benzene	ND		1.00	µg/L	1			
Carbon tetrachloride	4.24		1.00	µg/L	1			
Chloroethane	ND		1.00	µg/L	1			
Chloroform	0.829	J	1.00	µg/L	1			
cis-1,2-Dichloroethene	ND		1.00	µg/L	1			
Ethylbenzene	ND		1.00	µg/L	1			
m,p-Xylene	ND		1.00	µg/L	1			
Methylene chloride	ND		2.00	µg/L	1			
Naphthalene	ND		1.00	µg/L	1			
o-Xylene	ND		1.00	µg/L	1			
Tetrachloroethene	ND		1.00	µg/L	1			
Toluene	ND		1.00	µg/L	1			
trans-1,2-Dichloroethene	ND		1.00	µg/L	1			
Trichloroethene	902		25.0	µg/L	25	1/7/2005 1:20:00 PM	LINUS_050107C	DWW
Vinyl chloride	ND		1.00	µg/L	1	1/6/2005 3:30:00 AM	LINUS_050105E	GP
Surr:1,2-Dichloroethane-d4	96		70 - 130	%REC	1	1/6/2005 3:30:00 AM	LINUS_050105E	GP
Surr:4-Bromofluorobenzene	97		70 - 130	%REC	1			
Surr:Toluene-d8	95		70 - 130	%REC	1			

Definitions:

* - Recovery outside QC limits

DF - Dilution Factor

H - Value Exceeds Maximum Contaminant Level

N - Single Column Analysis

NP - Petroleum Pattern is not present

B - Analyte found in Method blank

DNI - Did not Ignite

J - Estimated value

NC - Not Calculated

P - Post Spike Recovery outside limits

D - Diluted due to matrix or extended target compounds

E - Result above quantitation limit (high standard or ICP linear range).

M - Matrix Spike Recovery outside limits

ND - Not Detected at the Reporting Limit

R - RPD outside recovery limits

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Client: Parsons Engineering Science, Inc.

Client Sample ID: C-42GW002

Lab Order: 0501021

Alt. Client ID:

Project: Tooele RCRA Phase II

Collection Date: 1/3/2005 10:42:00 AM % Moist:

Lab ID: 0501021-07A

Sample Type: SAMP

Matrix: Water

Test Code: C_8260B_5030B_LL_W_018

LOW LEVEL VOCS BY METHOD 8260B

Method: SW8260B

Prep Method: SW5030B_LL

Analyte	Result	Q	RL	Units	DF	Date Analyzed	Run Batch ID	Analyst
1,1,1-Trichloroethane	ND		1.00	µg/L	1	1/6/2005 4:34:00 AM	LINUS_050105E	GP
1,1,2-Trichloroethane	0.577	J	1.00	µg/L	1			
1,1-Dichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethene	0.203	J	1.00	µg/L	1			
1,2-Dichloroethane	ND		1.00	µg/L	1			
1,2-Dichloropropane	ND		1.00	µg/L	1			
Benzene	ND		1.00	µg/L	1			
Carbon tetrachloride	4.93		1.00	µg/L	1			
Chloroethane	ND		1.00	µg/L	1			
Chloroform	0.815	J	1.00	µg/L	1			
cis-1,2-Dichloroethene	ND		1.00	µg/L	1			
Ethylbenzene	ND		1.00	µg/L	1			
m,p-Xylene	ND		1.00	µg/L	1			
Methylene chloride	ND		2.00	µg/L	1			
Naphthalene	ND		1.00	µg/L	1			
o-Xylene	ND		1.00	µg/L	1			
Tetrachloroethene	0.165	J	1.00	µg/L	1			
Toluene	ND		1.00	µg/L	1			
trans-1,2-Dichloroethene	ND		1.00	µg/L	1			
Trichloroethene	1010		25.0	µg/L	25	1/7/2005 1:52:00 PM	LINUS_050107C	DWW
Vinyl chloride	ND		1.00	µg/L	1	1/6/2005 4:34:00 AM	LINUS_050105E	GP
Surr:1,2-Dichloroethane-d4	96		70 - 130	%REC	1	1/6/2005 4:34:00 AM	LINUS_050105E	GP
Surr:4-Bromofluorobenzene	96		70 - 130	%REC	1			
Surr:Toluene-d8	94		70 - 130	%REC	1			

Definitions:

* - Recovery outside QC limits

DF - Dilution Factor

H - Value Exceeds Maximum Contaminant Level

N - Single Column Analysis

NP - Petroleum Pattern is not present

B - Analyte found in Method blank

DNI - Did not Ignite

J - Estimated value

NC - Not Calculated

P - Post Spike Recovery outside limits

D - Diluted due to matrix or extended target compounds

E - Result above quantitation limit (high standard or ICP linear range).

M - Matrix Spike Recovery outside limits

ND - Not Detected at the Reporting Limit

R - RPD outside recovery limits

Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Client: Parsons Engineering Science, Inc.

Client Sample ID: C-42GW003

Lab Order: 0501021

Alt. Client ID:

Project: Tooele RCRA Phase II

Collection Date: 1/3/2005 10:52:00 AM % Moist:

Lab ID: 0501021-08A

Sample Type: SAMP

Matrix: Water

Test Code: C_8260B_5030B_LL_W_018

LOW LEVEL VOCs BY METHOD 8260B

Method: SW8260B

Prep Method: SW5030B_LL

Analyte	Result	Q	RL	Units	DF	Date Analyzed	Run Batch ID	Analyst
1,1,1-Trichloroethane	ND		1.00	µg/L	1	1/6/2005 4:02:00 AM	LINUS_050105E	GP
1,1,2-Trichloroethane	0.635	J	1.00	µg/L	1			
1,1-Dichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethene	0.214	J	1.00	µg/L	1			
1,2-Dichloroethane	ND		1.00	µg/L	1			
1,2-Dichloropropane	0.0970	J	1.00	µg/L	1			
Benzene	ND		1.00	µg/L	1			
Carbon tetrachloride	4.72		1.00	µg/L	1			
Chloroethane	ND		1.00	µg/L	1			
Chloroform	0.826	J	1.00	µg/L	1			
cis-1,2-Dichloroethene	ND		1.00	µg/L	1			
Ethylbenzene	ND		1.00	µg/L	1			
m,p-Xylene	ND		1.00	µg/L	1			
Methylene chloride	ND		2.00	µg/L	1			
Naphthalene	ND		1.00	µg/L	1			
o-Xylene	ND		1.00	µg/L	1			
Tetrachloroethene	0.142	J	1.00	µg/L	1			
Toluene	ND		1.00	µg/L	1			
trans-1,2-Dichloroethene	ND		1.00	µg/L	1			
Trichloroethene	958		25.0	µg/L	25	1/7/2005 3:58:00 PM	LINUS_050107C	DWW
Vinyl chloride	ND		1.00	µg/L	1	1/6/2005 4:02:00 AM	LINUS_050105E	GP
Surr:1,2-Dichloroethane-d4	97		70 - 130	%REC	1	1/6/2005 4:02:00 AM	LINUS_050105E	GP
Surr:4-Bromofluorobenzene	97		70 - 130	%REC	1			
Surr:Toluene-d8	95		70 - 130	%REC	1			

Definitions:

* - Recovery outside QC limits

DF - Dilution Factor

H - Value Exceeds Maximum Contaminant Level

N - Single Column Analysis

NP - Petroleum Pattern is not present

B - Analyte found in Method blank

DNI - Did not Ignite

J - Estimated value

NC - Not Calculated

P - Post Spike Recovery outside limits

D - Diluted due to matrix or extended target compounds

E - Result above quantitation limit (high standard or ICP linear range).

M - Matrix Spike Recovery outside limits

ND - Not Detected at the Reporting Limit

R - RPD outside recovery limits



Analytical Services Center
International Specialists in Environmental Analysis
4493 Walden Avenue
Lancaster, New York 14086

Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Client: Parsons Engineering Science, Inc.

Client Sample ID: C-43GW001

Lab Order: 0501021

Alt. Client ID:

Project: Tooele RCRA Phase II

Collection Date: 1/3/2005 11:37:00 AM % Moist:

Lab ID: 0501021-09A

Sample Type: SAMP

Matrix: Water

Test Code: C_8260B_5030B_LL_W_018

LOW LEVEL VOCs BY METHOD 8260B

Method: SW8260B

Prep Method: SW5030B_LL

Analyte	Result	Q	RL	Units	DF	Date Analyzed	Run Batch ID	Analyst
1,1,1-Trichloroethane	ND		1.00	µg/L	1	1/7/2005 4:30:00 PM	LINUS_050107C	DWW
1,1,2-Trichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethene	ND		1.00	µg/L	1			
1,2-Dichloroethane	ND		1.00	µg/L	1			
1,2-Dichloropropane	ND		1.00	µg/L	1			
Benzene	ND		1.00	µg/L	1			
Carbon tetrachloride	0.624	J	1.00	µg/L	1			
Chloroethane	ND		1.00	µg/L	1			
Chloroform	0.130	J	1.00	µg/L	1			
cis-1,2-Dichloroethene	ND		1.00	µg/L	1			
Ethylbenzene	ND		1.00	µg/L	1			
m,p-Xylene	ND		1.00	µg/L	1			
Methylene chloride	ND		2.00	µg/L	1			
Naphthalene	ND		1.00	µg/L	1			
o-Xylene	ND		1.00	µg/L	1			
Tetrachloroethene	ND		1.00	µg/L	1			
Toluene	ND		1.00	µg/L	1			
trans-1,2-Dichloroethene	ND		1.00	µg/L	1			
Trichloroethene	123		4.00	µg/L	4	1/10/2005 4:29:00 PM	LINUS_050110C	
Vinyl chloride	ND		1.00	µg/L	1	1/7/2005 4:30:00 PM	LINUS_050107C	
Surr:1,2-Dichloroethane-d4	95		70 - 130	%REC	1	1/7/2005 4:30:00 PM	LINUS_050107C	DWW
Surr:4-Bromofluorobenzene	98		70 - 130	%REC	1			
Surr:Toluene-d8	93		70 - 130	%REC	1			

Definitions:

* - Recovery outside QC limits

DF - Dilution Factor

H - Value Exceeds Maximum Contaminant Level

N - Single Column Analysis

NP - Petroleum Pattern is not present

B - Analyte found in Method blank

DNI - Did not Ignite

J - Estimated value

NC - Not Calculated

P - Post Spike Recovery outside limits

D - Diluted due to matrix or extended target compounds

E - Result above quantitation limit (high standard or ICP linear range).

M - Matrix Spike Recovery outside limits

ND - Not Detected at the Reporting Limit

R - RPD outside recovery limits



Analytical Services Center
International Specialists in Environmental Analysis
4493 Walden Avenue
Lancaster, New York 14086

a division of
ecology and environment, inc.

Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Client: Parsons Engineering Science, Inc.

Client Sample ID: C-43GW002

Lab Order: 0501021

Alt. Client ID:

Project: Tooele RCRA Phase II

Collection Date: 1/3/2005 11:44:00 AM % Moist:

Lab ID: 0501021-10A

Sample Type: SAMP

Matrix: Water

Test Code: C_8260B_5030B_LL_W_018

LOW LEVEL VOCS BY METHOD 8260B

Method: SW8260B

Prep Method: SW5030B_LL

Analyte	Result	Q	RL	Units	DF	Date Analyzed	Run Batch ID	Analyst
1,1,1-Trichloroethane	ND		1.00	µg/L	1	1/7/2005 5:02:00 PM	LINUS_050107C	DWW
1,1,2-Trichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethene	ND		1.00	µg/L	1			
1,2-Dichloroethane	ND		1.00	µg/L	1			
1,2-Dichloropropane	ND		1.00	µg/L	1			
Benzene	ND		1.00	µg/L	1			
Carbon tetrachloride	0.606	J	1.00	µg/L	1			
Chloroethane	ND		1.00	µg/L	1			
Chloroform	0.145	J	1.00	µg/L	1			
cis-1,2-Dichloroethene	ND		1.00	µg/L	1			
Ethylbenzene	ND		1.00	µg/L	1			
m,p-Xylene	ND		1.00	µg/L	1			
Methylene chloride	ND		2.00	µg/L	1			
Naphthalene	ND		1.00	µg/L	1			
o-Xylene	ND		1.00	µg/L	1			
Tetrachloroethene	ND		1.00	µg/L	1			
Toluene	ND		1.00	µg/L	1			
trans-1,2-Dichloroethene	ND		1.00	µg/L	1			
Trichloroethene	133		4.00	µg/L	4	1/10/2005 5:01:00 PM	LINUS_050110C	
Vinyl chloride	ND		1.00	µg/L	1	1/7/2005 5:02:00 PM	LINUS_050107C	
Surr:1,2-Dichloroethane-d4	94		70 - 130	%REC	1	1/7/2005 5:02:00 PM	LINUS_050107C	DWW
Surr:4-Bromofluorobenzene	97		70 - 130	%REC	1			
Surr:Toluene-d8	92		70 - 130	%REC	1			

Definitions:

* - Recovery outside QC limits

DF - Dilution Factor

H - Value Exceeds Maximum Contaminant Level

N - Single Column Analysis

NP - Petroleum Pattern is not present

B - Analyte found in Method blank

DNI - Did not Ignite

J - Estimated value

NC - Not Calculated

P - Post Spike Recovery outside limits

D - Diluted due to matrix or extended target compounds

E - Result above quantitation limit (high standard or ICP linear range).

M - Matrix Spike Recovery outside limits

ND - Not Detected at the Reporting Limit

R - RPD outside recovery limits

**Analytical Services Center**

International Specialists in Environmental Analysis

4493 Walden Avenue

ecology and environment, inc. Lancaster, New York 14086

Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Client: Parsons Engineering Science, Inc.

Client Sample ID: C-43GW003

Lab Order: 0501021

Alt. Client ID:

Project: Tooele RCRA Phase II

Collection Date: 1/3/2005 11:50:00 AM % Moist:

Lab ID: 0501021-11A

Sample Type: SAMP

Matrix: Water

Test Code: C_8260B_5030B_LL_W_018

LOW LEVEL VOCS BY METHOD 8260B

Method: SW8260B

Prep Method: SW5030B_LL

Analyte	Result	Q	RL	Units	DF	Date Analyzed	Run Batch ID	Analyst
1,1,1-Trichloroethane	ND		1.00	µg/L	1	1/7/2005 5:34:00 PM	LINUS_050107C	DWW
1,1,2-Trichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethene	ND		1.00	µg/L	1			
1,2-Dichloroethane	ND		1.00	µg/L	1			
1,2-Dichloropropane	ND		1.00	µg/L	1			
Benzene	ND		1.00	µg/L	1			
Carbon tetrachloride	0.642	J	1.00	µg/L	1			
Chloroethane	ND		1.00	µg/L	1			
Chloroform	0.135	J	1.00	µg/L	1			
cis-1,2-Dichloroethene	ND		1.00	µg/L	1			
Ethylbenzene	ND		1.00	µg/L	1			
m,p-Xylene	ND		1.00	µg/L	1			
Methylene chloride	ND		2.00	µg/L	1			
Naphthalene	ND		1.00	µg/L	1			
o-Xylene	ND		1.00	µg/L	1			
Tetrachloroethene	ND		1.00	µg/L	1			
Toluene	ND		1.00	µg/L	1			
trans-1,2-Dichloroethene	ND		1.00	µg/L	1			
Trichloroethene	121		4.00	µg/L	4	1/10/2005 5:32:00 PM	LINUS_050110C	
Vinyl chloride	ND		1.00	µg/L	1	1/7/2005 5:34:00 PM	LINUS_050107C	
Surr:1,2-Dichloroethane-d4	96		70 - 130	%REC	1	1/7/2005 5:34:00 PM	LINUS_050107C	DWW
Surr:4-Bromofluorobenzene	96		70 - 130	%REC	1			
Surr:Toluene-d8	92		70 - 130	%REC	1			

Definitions:

* - Recovery outside QC limits

DF - Dilution Factor

H - Value Exceeds Maximum Contaminant Level

N - Single Column Analysis

NP - Petroleum Pattern is not present

B - Analyte found in Method blank

DNI - Did not Ignite

J - Estimated value

NC - Not Calculated

P - Post Spike Recovery outside limits

D - Diluted due to matrix or extended target compounds

E - Result above quantitation limit (high standard or ICP linear range).

M - Matrix Spike Recovery outside limits

ND - Not Detected at the Reporting Limit

R - RPD outside recovery limits



ANALYTICAL SERVICES CENTER
International Specialists in Environmental Analysis
4493 Walden Avenue
Lancaster, New York 14086

Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Client: Parsons Engineering Science, Inc.

Client Sample ID: C-44GW001

Lab Order: 0501021

Alt. Client ID:

Project: Tooele RCRA Phase II

Collection Date: 1/3/2005 12:38:00 PM % Moist:

Lab ID: 0501021-12A

Sample Type: SAMP

Matrix: Water

Test Code: C_8260B_5030B_LL_W_018

LOW LEVEL VOCS BY METHOD 8260B

Method: SW8260B

Prep Method: SW5030B_LL

Analyte	Result	Q	RL	Units	DF	Date Analyzed	Run Batch ID	Analyst
1,1,1-Trichloroethane	ND		1.00	µg/L	1	1/7/2005 6:06:00 PM	LINUS_050107C	DWW
1,1,2-Trichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethene	ND		1.00	µg/L	1			
1,2-Dichloroethane	ND		1.00	µg/L	1			
1,2-Dichloropropane	ND		1.00	µg/L	1			
Benzene	ND		1.00	µg/L	1			
Carbon tetrachloride	31.0		1.00	µg/L	1			
Chloroethane	ND		1.00	µg/L	1			
Chloroform	0.402	J	1.00	µg/L	1			
cis-1,2-Dichloroethene	ND		1.00	µg/L	1			
Ethylbenzene	ND		1.00	µg/L	1			
m,p-Xylene	ND		1.00	µg/L	1			
Methylene chloride	ND		2.00	µg/L	1			
Naphthalene	ND		1.00	µg/L	1			
o-Xylene	ND		1.00	µg/L	1			
Tetrachloroethene	ND		1.00	µg/L	1			
Toluene	ND		1.00	µg/L	1			
trans-1,2-Dichloroethene	ND		1.00	µg/L	1			
Trichloroethene	8.95		1.00	µg/L	1			
Vinyl chloride	ND		1.00	µg/L	1			
Surr:1,2-Dichloroethane-d4	97		70 - 130	%REC	1	1/7/2005 6:06:00 PM	LINUS_050107C	DWW
Surr:4-Bromofluorobenzene	97		70 - 130	%REC	1			
Surr:Toluene-d8	91		70 - 130	%REC	1			

Definitions:

* - Recovery outside QC limits

DF - Dilution Factor

H - Value Exceeds Maximum Contaminant Level

N - Single Column Analysis

NP - Petroleum Pattern is not present

B - Analyte found in Method blank

DNI - Did not Ignite

J - Estimated value

NC - Not Calculated

P - Post Spike Recovery outside limits

D - Diluted due to matrix or extended target compounds

E - Result above quantitation limit (high standard or ICP linear range).

M - Matrix Spike Recovery outside limits

ND - Not Detected at the Reporting Limit

R - RPD outside recovery limits



Analytical Services Center
International Specialists in Environmental Analysis
4493 Walden Avenue
Lancaster, New York 14086

Laboratory Results

NYS ELAP ID#: 10486
Phone: (716) 685-8080

Client: Parsons Engineering Science, Inc.

Client Sample ID: C-44GW002

Lab Order: 0501021

Alt. Client ID:

Project: Tooele RCRA Phase II

Collection Date: 1/3/2005 12:43:00 PM % Moist:

Lab ID: 0501021-13A

Sample Type: SAMP

Matrix: Water

Test Code: C_8260B_5030B_LL_W_018

LOW LEVEL VOCs BY METHOD 8260B

Method: SW8260B

Prep Method: SW5030B_LL

Analyte	Result	Q	RL	Units	DF	Date Analyzed	Run Batch ID	Analyst
1,1,1-Trichloroethane	ND		1.00	µg/L	1	1/11/2005 9:55:00 AM	LINUS_050111B	DWW
1,1,2-Trichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethene	ND		1.00	µg/L	1			
1,2-Dichloroethane	ND		1.00	µg/L	1			
1,2-Dichloropropane	ND		1.00	µg/L	1			
Benzene	ND		1.00	µg/L	1			
Carbon tetrachloride	29.5		1.00	µg/L	1			
Chloroethane	ND		1.00	µg/L	1			
Chloroform	0.377	J	1.00	µg/L	1			
cis-1,2-Dichloroethene	ND		1.00	µg/L	1			
Ethylbenzene	ND		1.00	µg/L	1			
m,p-Xylene	ND		1.00	µg/L	1			
Methylene chloride	ND		2.00	µg/L	1			
Naphthalene	ND		1.00	µg/L	1			
o-Xylene	ND		1.00	µg/L	1			
Tetrachloroethene	ND		1.00	µg/L	1			
Toluene	ND		1.00	µg/L	1			
trans-1,2-Dichloroethene	ND		1.00	µg/L	1			
Trichloroethene	8.22		1.00	µg/L	1			
Vinyl chloride	ND		1.00	µg/L	1			
Surr:1,2-Dichloroethane-d4	96		70 - 130	%REC	1	1/11/2005 9:55:00 AM	LINUS_050111B	DWW
Surr:4-Bromofluorobenzene	98		70 - 130	%REC	1			
Surr:Toluene-d8	94		70 - 130	%REC	1			

Definitions:

* - Recovery outside QC limits

DF - Dilution Factor

H - Value Exceeds Maximum Contaminant Level

N - Single Column Analysis

NP - Petroleum Pattern is not present

B - Analyte found in Method blank

DNI - Did not Ignite

J - Estimated value

NC - Not Calculated

P - Post Spike Recovery outside limits

D - Diluted due to matrix or extended target compounds

E - Result above quantitation limit (high standard or ICP linear range).

M - Matrix Spike Recovery outside limits

ND - Not Detected at the Reporting Limit

R - RPD outside recovery limits

**Analytical Services Center**

International Specialists in Environmental Analysis

4493 Walden Avenue

Lancaster, New York 14086

Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Client: Parsons Engineering Science, Inc.

Client Sample ID: C-44GW003

Lab Order: 0501021

Alt. Client ID:

Project: Tooele RCRA Phase II

Collection Date: 1/3/2005 12:48:00 PM % Moist:

Lab ID: 0501021-14A

Sample Type: SAMP

Matrix: Water

Test Code: C_8260B_5030B_LL_W_018

LOW LEVEL VOCS BY METHOD 8260B

Method: SW8260B

Prep Method: SW5030B_LL

Analyte	Result	Q	RL	Units	DF	Date Analyzed	Run Batch ID	Analyst
1,1,1-Trichloroethane	ND		1.00	µg/L	1	1/11/2005 10:26:00 AM	LINUS_050111B	DWW
1,1,2-Trichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethene	ND		1.00	µg/L	1			
1,2-Dichloroethane	ND		1.00	µg/L	1			
1,2-Dichloropropane	ND		1.00	µg/L	1			
Benzene	ND		1.00	µg/L	1			
Carbon tetrachloride	28.6		1.00	µg/L	1			
Chloroethane	ND		1.00	µg/L	1			
Chloroform	0.387	J	1.00	µg/L	1			
cis-1,2-Dichloroethene	ND		1.00	µg/L	1			
Ethylbenzene	ND		1.00	µg/L	1			
m,p-Xylene	ND		1.00	µg/L	1			
Methylene chloride	ND		2.00	µg/L	1			
Naphthalene	ND		1.00	µg/L	1			
o-Xylene	ND		1.00	µg/L	1			
Tetrachloroethene	ND		1.00	µg/L	1			
Toluene	ND		1.00	µg/L	1			
trans-1,2-Dichloroethene	ND		1.00	µg/L	1			
Trichloroethene	8.26		1.00	µg/L	1			
Vinyl chloride	ND		1.00	µg/L	1			
Surr:1,2-Dichloroethane-d4	95		70 - 130	%REC	1	1/11/2005 10:26:00 AM	LINUS_050111B	DWW
Surr:4-Bromofluorobenzene	97		70 - 130	%REC	1			
Surr:Toluene-d8	95		70 - 130	%REC	1			

Definitions:

* - Recovery outside QC limits

DF - Dilution Factor

H - Value Exceeds Maximum Contaminant Level

N - Single Column Analysis

NP - Petroleum Pattern is not present

B - Analyte found in Method blank

DNI - Did not Ignite

J - Estimated value

NC - Not Calculated

P - Post Spike Recovery outside limits

D - Diluted due to matrix or extended target compounds

E - Result above quantitation limit (high standard or ICP linear range).

M - Matrix Spike Recovery outside limits

ND - Not Detected at the Reporting Limit

R - RPD outside recovery limits

AUTOMATED DATA REVIEW SUMMARY

Facility: SWMU 58
Event: 2004 10 SWMU 58 Vertical Profile Borings
Contract: 9T9H213C
Sample Delivery Group: 0501021

Field Contractor: Parsons Engineering Science, Salt Lake City
Laboratory Contractor: Ecology and Environment, Inc., Lancaster, NY
Data Review Contractor: Synectics, Sacramento, CA
Guidance Document: *Final Phase II RCRA Facility Investigation SWMU-58 Workplan, December 2003*

Analytical Method	Normal Samples	Field QC Samples
SW8260B	12	2

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in Final Phase II RCRA Facility Investigation SWMU-58 Workplan, December 2003 to the extent possible. Where definitive guidance is not provided, data has been evaluated in a conservative manner using professional judgment. In cases where two qualifiers are listed as an action, such as "J/UJ", the first qualifier applies to positive results, and the second to non-detect results.

Samples were collected by Parsons Engineering Science, Salt Lake City; analyses were performed by Ecology and Environment, Inc., Lancaster, NY and were reported under sample delivery group (SDG) 0501021. Results have been evaluated electronically using electronic data deliverables (EDDs) provided by the laboratory. The laboratory data summary forms (hard copy) have been reviewed during this effort and compared to the automated review output. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative. The following quality control elements were evaluated during this review effort:

- Technical Holding Times
- Continuing Calibration Verification
- Method Blank Contamination
- Field Blank Contamination
- Blank Spike Accuracy
- Blank Spike Precision
- Matrix Spike Accuracy
- Matrix Spike Precision
- Surrogate Recovery
- Laboratory Duplicate Precision
- Field Duplicate Precision

A minimum of ten percent of sample and QC results were manually evaluated for compliance with project specific requirements and consistency with hard copy results. The following reports were generated during the evaluation of this data set and are presented as attachments to this report as applicable.

Data Submission Warnings – Warnings encountered during the data submission process are evaluated and their affect on data quality is discussed in the narrative.

Batch – The analytical batch report is reviewed for completeness and compliance with project specific requirements. Incomplete or non-compliant run sequences are identified and their impact on data quality are discussed in the narrative.

QC Outlier – Results exceeding the evaluation criteria are reviewed for compliance with project requirements and a minimum of ten percent of the non-compliant QC values reported electronically are verified for consistency with hard-copy values.

Qualified Results – Qualified results are evaluated for compliance with project requirements and ten percent of qualified results are verified for consistency with the QC Outlier Report.

Field Duplicate – Field duplicate comparison results are evaluated for compliance with project requirements and ten percent of values reported are verified for consistency with the hard-copy data.

Rejected Results – All rejected results are evaluated for compliance with project requirements. The reason for rejection of the data is verified against hard copy data.

Analytical deficiencies, project non-compliance issues and inconsistencies with hard copy results observed during ADR evaluation process and their impact on data quality are summarized in the ADR narrative.

Out of control events experienced by the laboratory have warranted the qualification of 0 % (0 results) and the rejection of 0 % (0 results) of the data set. These deficiencies are detailed in the referenced attachments, and discussed in the ADR narrative, where appropriate.

Released by

Date

Reason and Comment Codes

<u>Code</u>	<u>Definition</u>
C1	Diluted Out
C2	Flag Parent Only
C2S	Flag Parent (Soil); Batch (Water)
C3	No Action
C4	No QC Outliers
C5	One or both values <5x RL
C6	Recalculated Value
C7	Material Blanks
C8	Spike Insignificant
C9	No Flags; set to ND by method/cal. blank

Reasons

<u>Code</u>	<u>Definition</u>
A	Serial dilution
B	Calibration Blank - Negative
	Negative Blank
B1	Blank
B2	Calibration Blank
C	Continuing Calibration Verification
	Continuing Calibration Verification RRF
D	BS RPD
	Field Duplicate RPD
D1	Lab Replicate RPD
D2	MS RPD
E	Exceeds Linear Calibration Range
F	Hydrocarbon pattern does not match standard
G	Initial Calibration RRF
	Initial Calibration RSD
H	Test Hold Time
	Prep Hold Time
I	Internal standard
K1	Equip Blank
K2	Field Blank
K3	Trip Blank
L	LCS Recovery
M	MS Recovery
N	Blank - No Action
O	Interference check sample
P	Column RPD
Q	Material Blank
S	Surrogate
T	Receipt Temperature
TI	Tentatively Identified Compound
TR	Trace Level Detect
W	Column breakdown (pesticides)
X	Raised reporting limit
Y	Analyte not confirmed on second column

ADR CASE NARRATIVE

Laboratory ID: SDG# 0501021

Prior to loading and processing data, modifications to the project setup may be requested by the laboratory and/or contractor, and approved by the client. These modifications allow the loading of data that was not in complete agreement with the project guidance document; in some cases, variances to the project document may be in process, in others, the changes are required to accept data that had not been generated in compliance with the project guidance document. All project setup modifications are listed below:

There were no project setup modifications associated with this sample delivery group.

Chemistry Data Quality

The data submission process incorporates a series of stored procedures designed to identify conditions in electronic data deliverables (EDD) that would affect chemistry data quality. These conditions will not result in the qualification of the data; however, these findings should be reviewed for possible contractual non-compliance. A brief explanation of each finding encountered for this data set and the potential impact on chemistry data quality is summarized below.

1. Reporting Limit

It was found that all field sample reporting limits (RL) reported by the lab did not meet the project specified RLs required in the project setup.

Data Verification

The data verification process includes a manual review of information on the chains of custody and laboratory case narratives, a check of all rejected results and a minimum of 10 percent of sample and QC results for consistency with hard copy reports, and a cursory review of all reports generated during the automated review process. The following comments are associated with the verification process:

1. Volatile Organics by SW8260

The project setup requires that only CCCs be evaluated for the continuing calibration verification (CV). The laboratory appears to have reported all target analytes for the CV. Only the CCCs were evaluated.

Due to multiple analysis of the parent samples and matrix spike samples, the data flagging system could not be determined either percent recovery or RPD for the matrix spike (MS) and matrix spike duplicate (SD). The data was manually reviewed and all values found to be within project specified acceptance criteria. No further action was necessary.

All of the reports utilized during the data verification process are provided as attachments to this report.

Batch Report

Facility: SWMU 58
 Lab: ECEN
 Filename: 0501021
 Status: Certified - 1/18/2005
 User: RebeccaHumphrey

Test Method: SW8260B
 Prep Method: SW5030
 Leach Method: NONE

<u>Test Batch</u>	<u>Prep Batch</u>	<u>Leach Batch</u>	<u>Location</u>	<u>Matrix</u>	<u>Field Sample ID</u>	<u>Lab Sample ID</u>	<u>Test Date and Time</u>	<u>Sample Type</u>
LINU50105E	0501054I2r	NA	LABQC	WQ		CCV1093080	1/5/2005 7:21:00PM	CV1
	0501054I2r	NA	LABQC	WQ		LCS1851631	1/5/2005 8:07:00PM	BS1
	0501054I2r	NA	LABQC	WQ		MB1851632	1/5/2005 9:21:00PM	LB1
	0501054I2r	NA	FIELDQC	WQ	PARSTB1	0501021-01	1/5/2005 11:16:00PM	TB1
	0501054I2r	NA	C-41	WG	C-41GW001	0501021-02	1/6/2005 1:23:00AM	N1
	0501054I2r	NA	C-41	WG	C-41FD001	0501021-03	1/6/2005 1:55:00AM	FD1
	0501054I2r	NA	C-41	WG	C-41GW002	0501021-04	1/6/2005 2:27:00AM	N1
	0501054I2r	NA	C-41	WG	C-41GW003	0501021-05	1/6/2005 2:59:00AM	N1
	0501054I2r	NA	C-42	WG	C-42GW001	0501021-06	1/6/2005 3:30:00AM	N1
	0501054I2r	NA	C-42	WG	C-42GW003	0501021-08	1/6/2005 4:02:00AM	N1
	0501054I2r	NA	C-42	WG	C-42GW002	0501021-07	1/6/2005 4:34:00AM	N1
	0501054I2r	NA	C-42	WG	C-42GW002	0501021-07	1/6/2005 5:06:00AM	MS1
	0501054I2r	NA	C-42	WG	C-42GW002	0501021-07	1/6/2005 5:38:00AM	SD1
LINU50107C	0501074I1r	NA	LABQC	WQ		CCV1093081	1/7/2005 6:59:00AM	CV1
	0501074I1r	NA	LABQC	WQ		LCS1851651	1/7/2005 7:31:00AM	BS1
	0501074I1r	NA	LABQC	WQ		MB1851652	1/7/2005 8:34:00AM	LB1
	0501074I1r	NA	C-42	WG	C-42GW001	0501021-06	1/7/2005 1:20:00PM	N1
	0501074I1r	NA	C-42	WG	C-42GW002	0501021-07	1/7/2005 1:52:00PM	N1
	0501074I1r	NA	C-42	WG	C-42GW002	0501021-07	1/7/2005 2:23:00PM	MS1
	0501074I1r	NA	C-42	WG	C-42GW002	0501021-07	1/7/2005 2:55:00PM	SD1
	0501074I1r	NA	C-42	WG	C-42GW003	0501021-08	1/7/2005 3:58:00PM	N1
	0501074I1r	NA	C-43	WG	C-43GW001	0501021-09	1/7/2005 4:30:00PM	N1
	0501074I1r	NA	C-43	WG	C-43GW002	0501021-10	1/7/2005 5:02:00PM	N1
	0501074I1r	NA	C-43	WG	C-43GW003	0501021-11	1/7/2005 5:34:00PM	N1
	0501074I1r	NA	C-44	WG	C-44GW001	0501021-12	1/7/2005 6:06:00PM	N1

Batch Report

Facility: SWMU 58
Lab: ECEN
Filename: 0501021
Status: Certified - 1/18/2005
User: RebeccaHumphrey

Test Method: SW8260B
Prep Method: SW5030
Leach Method: NONE

<u>Test Batch</u>	<u>Prep Batch</u>	<u>Leach Batch</u>	<u>Location</u>	<u>Matrix</u>	<u>Field Sample ID</u>	<u>Lab Sample ID</u>	<u>Test Date and Time</u>	<u>Sample Type</u>
LINU50110C	0501104I1r	NA	LABQC	WQ		CCV1093082	1/10/2005 8:00:00AM	CV1
	0501104I1r	NA	LABQC	WQ		LCS1851661	1/10/2005 8:32:00AM	BS1
	0501104I1r	NA	LABQC	WQ		MB1851661	1/10/2005 10:07:00AM	LB1
	0501104I1r	NA	C-43	WG	C-43GW001	0501021-09	1/10/2005 4:29:00PM	N1
	0501104I1r	NA	C-43	WG	C-43GW002	0501021-10	1/10/2005 5:01:00PM	N1
	0501104I1r	NA	C-43	WG	C-43GW003	0501021-11	1/10/2005 5:32:00PM	N1
LINU50111B	0501114I1r	NA	LABQC	WQ		CCV1093083	1/11/2005 7:16:00AM	CV1
	0501114I1r	NA	LABQC	WQ		LCS1851671	1/11/2005 7:48:00AM	BS1
	0501114I1r	NA	LABQC	WQ		MB1851672	1/11/2005 8:51:00AM	LB1
	0501114I1r	NA	C-44	WG	C-44GW002	0501021-13	1/11/2005 9:55:00AM	N1
	0501114I1r	NA	C-44	WG	C-44GW003	0501021-14	1/11/2005 10:26:00AM	N1

Detected Results

Facility: SWMU 58
Event: 2004 10 SWMU 58 Vertical Profile Borings
Reference: ISSS-539-01

SDG: 0501021

Volatile Organic Compounds by Capillary GC/MS

Test/Leach	Matrix	Field Sample ID	Type	Analyte	RL	Lab Result	Qualified Result	Units	Reason
SW8260B/NONE	WG	C-41FD001	FD	Carbon Tetrachloride	1.0	0.25 J	0.25 J	UG/L	TR
SW8260B/NONE	WG	C-41FD001	FD	Trichloroethene (TCE)	1.0	19	19	UG/L	
SW8260B/NONE	WG	C-41GW001	N	Carbon Tetrachloride	1.0	0.23 J	0.23 J	UG/L	TR
SW8260B/NONE	WG	C-41GW001	N	Trichloroethene (TCE)	1.0	19	19	UG/L	
SW8260B/NONE	WG	C-41GW002	N	Carbon Tetrachloride	1.0	0.24 J	0.24 J	UG/L	TR
SW8260B/NONE	WG	C-41GW002	N	Trichloroethene (TCE)	1.0	18	18	UG/L	
SW8260B/NONE	WG	C-41GW003	N	Carbon Tetrachloride	1.0	0.23 J	0.23 J	UG/L	TR
SW8260B/NONE	WG	C-41GW003	N	Trichloroethene (TCE)	1.0	16	16	UG/L	
SW8260B/NONE	WG	C-42GW001	N	1,1,2-Trichloroethane	1.0	0.54 J	0.54 J	UG/L	TR
SW8260B/NONE	WG	C-42GW001	N	1,1-Dichloroethene	1.0	0.20 J	0.20 J	UG/L	TR
SW8260B/NONE	WG	C-42GW001	N	Carbon Tetrachloride	1.0	4.2	4.2	UG/L	
SW8260B/NONE	WG	C-42GW001	N	Chloroform	1.0	0.83 J	0.83 J	UG/L	TR
SW8260B/NONE	WG	C-42GW001	N	Trichloroethene (TCE)	25	900	900	UG/L	
SW8260B/NONE	WG	C-42GW002	N	1,1,2-Trichloroethane	1.0	0.58 J	0.58 J	UG/L	TR
SW8260B/NONE	WG	C-42GW002	N	1,1-Dichloroethene	1.0	0.20 J	0.20 J	UG/L	TR
SW8260B/NONE	WG	C-42GW002	N	Carbon Tetrachloride	1.0	4.9	4.9	UG/L	
SW8260B/NONE	WG	C-42GW002	N	Chloroform	1.0	0.82 J	0.82 J	UG/L	TR
SW8260B/NONE	WG	C-42GW002	N	Tetrachloroethene (PCE)	1.0	0.17 J	0.17 J	UG/L	TR
SW8260B/NONE	WG	C-42GW002	N	Trichloroethene (TCE)	25	1,000	1,000	UG/L	
SW8260B/NONE	WG	C-42GW003	N	1,1,2-Trichloroethane	1.0	0.64 J	0.64 J	UG/L	TR
SW8260B/NONE	WG	C-42GW003	N	1,1-Dichloroethene	1.0	0.21 J	0.21 J	UG/L	TR
SW8260B/NONE	WG	C-42GW003	N	1,2-Dichloropropane	1.0	0.097 J	0.097 J	UG/L	TR
SW8260B/NONE	WG	C-42GW003	N	Carbon Tetrachloride	1.0	4.7	4.7	UG/L	
SW8260B/NONE	WG	C-42GW003	N	Chloroform	1.0	0.83 J	0.83 J	UG/L	TR
SW8260B/NONE	WG	C-42GW003	N	Tetrachloroethene (PCE)	1.0	0.14 J	0.14 J	UG/L	TR
SW8260B/NONE	WG	C-42GW003	N	Trichloroethene (TCE)	25	960	960	UG/L	
SW8260B/NONE	WG	C-43GW001	N	Carbon Tetrachloride	1.0	0.62 J	0.62 J	UG/L	TR

SDG: 0501021

Volatile Organic Compounds by Capillary GC/MS

<u>Test/Leach</u>	<u>Matrix</u>	<u>Field Sample ID</u>	<u>Type</u>	<u>Analyte</u>	<u>RL</u>	<u>Lab Result</u>	<u>Qualified Result</u>	<u>Units</u>	<u>Reason</u>
SW8260B/NONE	WG	C-43GW001	N	Chloroform	1.0	0.13 J	0.13 J	UG/L	TR
SW8260B/NONE	WG	C-43GW001	N	Trichloroethene (TCE)	4.0	120	120	UG/L	
SW8260B/NONE	WG	C-43GW002	N	Carbon Tetrachloride	1.0	0.61 J	0.61 J	UG/L	TR
SW8260B/NONE	WG	C-43GW002	N	Chloroform	1.0	0.15 J	0.15 J	UG/L	TR
SW8260B/NONE	WG	C-43GW002	N	Trichloroethene (TCE)	4.0	130	130	UG/L	
SW8260B/NONE	WG	C-43GW003	N	Carbon Tetrachloride	1.0	0.64 J	0.64 J	UG/L	TR
SW8260B/NONE	WG	C-43GW003	N	Chloroform	1.0	0.14 J	0.14 J	UG/L	TR
SW8260B/NONE	WG	C-43GW003	N	Trichloroethene (TCE)	4.0	120	120	UG/L	
SW8260B/NONE	WG	C-44GW001	N	Carbon Tetrachloride	1.0	31	31	UG/L	
SW8260B/NONE	WG	C-44GW001	N	Chloroform	1.0	0.40 J	0.40 J	UG/L	TR
SW8260B/NONE	WG	C-44GW001	N	Trichloroethene (TCE)	1.0	9.0	9.0	UG/L	
SW8260B/NONE	WG	C-44GW002	N	Carbon Tetrachloride	1.0	30	30	UG/L	
SW8260B/NONE	WG	C-44GW002	N	Chloroform	1.0	0.38 J	0.38 J	UG/L	TR
SW8260B/NONE	WG	C-44GW002	N	Trichloroethene (TCE)	1.0	8.2	8.2	UG/L	
SW8260B/NONE	WG	C-44GW003	N	Carbon Tetrachloride	1.0	29	29	UG/L	
SW8260B/NONE	WG	C-44GW003	N	Chloroform	1.0	0.39 J	0.39 J	UG/L	TR
SW8260B/NONE	WG	C-44GW003	N	Trichloroethene (TCE)	1.0	8.3	8.3	UG/L	

Qualified Results

Facility: SWMU 58
 Event: 2004 10 SWMU 58 Vertical Profile Borings
 Reference: ISSS-539-01

SDG: 0501021

Volatile Organic Compounds by Capillary GC/MS

Test/Leach	Matrix	Field Sample ID	Type	Analyte	RL	Lab Result	Qualified Result	Units	Reason
SW8260B/NONE	WG	C-41FD001	FD	Carbon Tetrachloride	1.0	0.25 J	0.25 J	UG/L	TR
SW8260B/NONE	WG	C-41GW001	N	Carbon Tetrachloride	1.0	0.23 J	0.23 J	UG/L	TR
SW8260B/NONE	WG	C-41GW002	N	Carbon Tetrachloride	1.0	0.24 J	0.24 J	UG/L	TR
SW8260B/NONE	WG	C-41GW003	N	Carbon Tetrachloride	1.0	0.23 J	0.23 J	UG/L	TR
SW8260B/NONE	WG	C-42GW001	N	1,1,2-Trichloroethane	1.0	0.54 J	0.54 J	UG/L	TR
SW8260B/NONE	WG	C-42GW001	N	1,1-Dichloroethene	1.0	0.20 J	0.20 J	UG/L	TR
SW8260B/NONE	WG	C-42GW001	N	Chloroform	1.0	0.83 J	0.83 J	UG/L	TR
SW8260B/NONE	WG	C-42GW002	N	1,1,2-Trichloroethane	1.0	0.58 J	0.58 J	UG/L	TR
SW8260B/NONE	WG	C-42GW002	N	1,1-Dichloroethene	1.0	0.20 J	0.20 J	UG/L	TR
SW8260B/NONE	WG	C-42GW002	N	Chloroform	1.0	0.82 J	0.82 J	UG/L	TR
SW8260B/NONE	WG	C-42GW002	N	Tetrachloroethene (PCE)	1.0	0.17 J	0.17 J	UG/L	TR
SW8260B/NONE	WG	C-42GW003	N	1,1,2-Trichloroethane	1.0	0.64 J	0.64 J	UG/L	TR
SW8260B/NONE	WG	C-42GW003	N	1,1-Dichloroethene	1.0	0.21 J	0.21 J	UG/L	TR
SW8260B/NONE	WG	C-42GW003	N	1,2-Dichloropropane	1.0	0.097 J	0.097 J	UG/L	TR
SW8260B/NONE	WG	C-42GW003	N	Chloroform	1.0	0.83 J	0.83 J	UG/L	TR
SW8260B/NONE	WG	C-42GW003	N	Tetrachloroethene (PCE)	1.0	0.14 J	0.14 J	UG/L	TR
SW8260B/NONE	WG	C-43GW001	N	Carbon Tetrachloride	1.0	0.62 J	0.62 J	UG/L	TR
SW8260B/NONE	WG	C-43GW001	N	Chloroform	1.0	0.13 J	0.13 J	UG/L	TR
SW8260B/NONE	WG	C-43GW002	N	Carbon Tetrachloride	1.0	0.61 J	0.61 J	UG/L	TR
SW8260B/NONE	WG	C-43GW002	N	Chloroform	1.0	0.15 J	0.15 J	UG/L	TR
SW8260B/NONE	WG	C-43GW003	N	Carbon Tetrachloride	1.0	0.64 J	0.64 J	UG/L	TR
SW8260B/NONE	WG	C-43GW003	N	Chloroform	1.0	0.14 J	0.14 J	UG/L	TR
SW8260B/NONE	WG	C-44GW001	N	Chloroform	1.0	0.40 J	0.40 J	UG/L	TR
SW8260B/NONE	WG	C-44GW002	N	Chloroform	1.0	0.38 J	0.38 J	UG/L	TR
SW8260B/NONE	WG	C-44GW003	N	Chloroform	1.0	0.39 J	0.39 J	UG/L	TR

DATA MANAGEMENT NARRATIVE

Laboratory ID: 0501021

Data Submission

The data submission process incorporates a series of stored procedures designed to identify valid value (VVL), logical (LE), and project specific errors (PSE) in electronic data deliverables (EDD). Automated data review (ADR) is most efficient when data generators correct all errors. Dependent primarily upon the electronic reporting capabilities of the data generator, the severity of the logical and project specific errors listed below have been reduced to warnings. A warning log is generated with each data submission and is presented as an attachment to this report. A brief explanation of each error encountered for this data set and the potential impact on data quality is summarized below.

1. Project Specific Error (PSE) spPSE01L_Invalid_Units_QC

This PSE occurs when laboratory quality control samples are reported with units of percent as opposed to true values. This inconsistency does not affect data quality, unless the submittal is scheduled for delivery to the AFCEE in accordance with the ERPIMS 4.0 specification. Automated data review can be performed for laboratory QC when units are reported in percent or in concentration units. However, to avoid this warning on future submittals, the laboratory would need to report these values in units of concentration (i.e., ug/L).

2. Logical Error (LE) spLE01_QAPPFLAGS_F

This LE warning occurs when there are positive results less than the RL and associated QAPPFLAGS are not "F". This requirement is only necessary if the project is an AFCEE project or if the data is to be submitted to ERPIMS. To avoid this warning in the future, apply QAPPFLAGS of "F" whenever the detected result is less than the RL.

A detailed description of the stored procedures utilized during the data submission process is provided as an attachment to this report (Submission Warnings).

Submission Warnings

Facility: SWMU 58
Data Generator: ECEN
File Name: W:\2005\0501021\0501021.LB1

PSE

<u>Query Name</u>	<u>Finding</u>	<u>Record Count</u>
spPSE01L_Invalid_Units_QC	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is TB/STD; UNITS is PERCENT	3
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is CV/STD; UNITS is PERCENT	12
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is N/STD; UNITS is PERCENT	36
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is BS/ORG; UNITS is PERCENT	16
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is MS/STD; UNITS is PERCENT	3
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is SD/ORG; UNITS is PERCENT	4
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is SD/STD; UNITS is PERCENT	3
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is LB/STD; UNITS is PERCENT	12
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is BS/STD; UNITS is PERCENT	12
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is FD/STD; UNITS is PERCENT	3
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is MS/ORG; UNITS is PERCENT	4
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is CV/ORG; UNITS is PERCENT	84

VVL

<u>Query Name</u>	<u>Finding</u>	<u>Record Count</u>
spLE01_QAPPFLAGS_F	PARVQ is TR; PARVAL is 0.4020; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.6420; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.1650; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2370; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.6350; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.6240; RL is 1.0000; QAPPFLAGS is J	1

Submission Warnings

Facility: SWMU 58
Data Generator: ECEN
File Name: W:\2005\0501021\0501021.LB1

VVL

<u>Query Name</u>	<u>Finding</u>	<u>Record Count</u>
spLE01_QAPPFLAGS_F	PARVQ is TR; PARVAL is 0.2010; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.6060; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2030; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.5770; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.1420; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.8290; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.5440; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2510; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.1450; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.3770; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2140; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.8260; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.8150; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.1350; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2310; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.1300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.0970; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.3870; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2290; RL is 1.0000; QAPPFLAGS is J	1

Submission Warnings

Facility: SWMU 58
Data Generator: ECEN
File Name: W:\2005\0501021\0501021.LB1

Total Record Count:	570
Error Count:	0
Warning Count:	217

APPENDIX G



406 West South Jordan Parkway, Suite 300 • South Jordan, Utah 84095 • (801) 572-5999 • Fax (801) 572-9069

Memorandum

To: Dean Reynolds, TEAD; Larry McFarland, TEAD
Copy: Maryellen Mackenzie, USACE; Carl Cole, USACE; Doug Mackenzie, USACE; Richard Jirik, Parsons
From: Jan Barbas, Parsons; Jeff Bigelow, Parsons
Date: Wednesday, December 01, 2004
Subject: TEAD SWMU-58 RFI - Waste Management

This letter is to recommend disposition of the 21 drums summarized in Table One, attached. The waste was generated in association with the drilling of well C-41.

Twenty-one drums of saturated soil cutting waste were generated and one sample was taken for each five drums. Therefore five samples were taken and labeled IDW13 – IDW17. Samples were analyzed for TCLP VOCs. Analysis were conducted by Ecology and Environment, Inc, Lancaster NY, a Utah Certified laboratory.

Results have been received as data packages and electronic data deliverables. Parsons has reviewed the data and found QC to be acceptable. Analytical results and case narrative are attached in portable document format.

Listed Wastes Analysis:

No constituents were detected. Therefore no listed waste codes should be applied.

Characteristic Wastes Analysis:

The waste is known to be primarily soil. Therefore generator's reasonable knowledge may be used to exclude the characteristics of ignitability, reactivity and corrosivity.

No constituents were detected. Therefore no characteristic waste codes (40 CFR Part 261.24) should be applied.

Disposition:

Parsons recommends that this waste be returned to the site for disposal on the ground surface.

Parsons will arrange to dispose of the waste per your written instructions.



Table One

Container ID	Owner	Sample?	Sample Comment	Container Size	Source	Contents	Open Date	Close Date	Accumulation Start Date	Disposition Due	Determination	Disposition	Disposition Date
PARSNZ0430501	JJB	YES		55-GALLON	DRILL CUTTINGS, C-41	SOIL	11/1/2004	11/1/2004	11/1/2004	1/20/2005			
Sites	Location	Move Date	Move Date	Move Date									
C-41	C-41	11/1/2004											
	UID-90	11/1/2004											

Container ID	Owner	Sample?	Sample Comment	Container Size	Source	Contents	Open Date	Close Date	Accumulation Start Date	Disposition Due	Determination	Disposition	Disposition Date
PARSNZ0430502	JJB	YES		55-GALLON	DRILL CUTTINGS, C-41	SOIL	11/1/2004	11/1/2004	11/1/2004	1/20/2005			
Sites	Location	Move Date	Move Date	Move Date									
C-41	C-41	11/1/2004											
	UID-90	11/1/2004											

Container ID	Owner	Sample?	Sample Comment	Container Size	Source	Contents	Open Date	Close Date	Accumulation Start Date	Disposition Due	Determination	Disposition	Disposition Date
PARSNZ0430503	JJB	YES		55-GALLON	DRILL CUTTINGS, C-41	SOIL	11/1/2004	11/1/2004	11/1/2004	1/20/2005			
Sites	Location	Move Date	Move Date	Move Date									
C-41	UID-90	11/1/2004											
	C-41	11/1/2004											

Container ID	Owner	Sample?	Sample Comment	Container Size	Source	Contents	Open Date	Close Date	Accumulation Start Date	Disposition Due	Determination	Disposition	Disposition Date
PARSNZ0430504	JJB	YES		55-GALLON	DRILL CUTTINGS, C-41	SOIL	11/1/2004	11/1/2004	11/1/2004	1/20/2005			
Sites	Location	Move Date	Move Date	Move Date									
C-41	UID-90	11/1/2004											
	C-41	11/1/2004											

Container ID	Owner	Sample?	Sample Comment	Container Size	Source	Contents	Open Date	Close Date	Accumulation Start Date	Disposition Due	Determination	Disposition	Disposition Date
PARSNZ0430505	JJB	YES		55-GALLON	DRILL CUTTINGS, C-41	SOIL	11/1/2004	11/1/2004	11/1/2004	1/20/2005			
Sites	Location	Move Date	Move Date	Move Date									
C-41	UID-90	11/1/2004											
	C-41	11/1/2004											

Container ID	Owner	Sample?	Sample Comment	Container Size	Source	Contents	Open Date	Close Date	Accumulation Start Date	Disposition Due	Determination	Disposition	Disposition Date
PARSNZ0430506	JJB	YES		55-GALLON	DRILL CUTTINGS, C-41	SOIL	11/1/2004	11/1/2004	11/1/2004	1/20/2005			
Sites	Location	Move Date	Move Date	Move Date									
C-41	UID-90	11/1/2004											
	C-41	11/1/2004											

Container ID	Owner	Sample?	Sample Comment	Container Size	Source	Contents	Open Date	Close Date	Accumulation Start Date	Disposition Due	Determination	Disposition	Disposition Date
PARSNZ0430507	JJB	YES		55-GALLON	DRILL CUTTINGS, C-41	SOIL	11/1/2004	11/1/2004	11/1/2004	1/20/2005			
Sites	Location	Move Date	Move Date	Move Date									
C-41	UID-90	11/1/2004											
	C-41	11/1/2004											

Container ID	Owner	Sample?	Sample Comment	Container Size	Source	Contents	Open Date	Close Date	Accumulation Start Date	Disposition Due	Determination	Disposition	Disposition Date
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[illegible][illegible][illegible][illegible][illegible][illegible][illegible]

[illegible][illegible][illegible]

Robert Ivers

From: McFarland, Larry [larry.mcfarland@us.army.mil]
Sent: Monday, December 13, 2004 1:23 PM
To: Barbas, Jan
Cc: Reynolds, Dean (Environmental)
Subject: FW: TEAD Phase II RFI Waste Management
Jan,

The TEAD Environmental Office has reviewed the attached analytical for soil cuttings generated at monitoring well C-41, and concurs with Parsons recommendation to return the drill cutting to the well site and spread them on the surface of the ground. Please provide TEAD with notification of the date when movement of the cuttings back to the well site is planned.

Thanks
Larry McFarland

-----Original Message-----

From: Barbas, Jan [mailto:Jan.Barbas@parsons.com]
Sent: Friday, December 03, 2004 11:58 AM
To: Bigelow, Jeff; colec@emh2.tooele.army.mil; reynoldd@emh2.tooele.army.mil;
doug.d.mackenzie@usace.army.mil; Jirik, Richard; mcfarlal@emh2.tooele.army.mil;
Maryellen.Mackenzie@usace.army.mil
Subject: TEAD Phase II RFI Waste Management

Hi,

Attached please find a memo recommending disposal for soil wastes from the drilling of C-41.

If you have any questions or comments please feel free to contact me.

Jan Barbas

Project Chemist

parsons

406 W. South Jordan Parkway, Suite 300

Salt Lake City, Utah 84095

(801) 572-5999 Voice

(801) 572-9069 FAX

jan.barbas@parsons.com

www.parsons.com



analytical services center

International Specialists in Environmental Analysis

4493 Walden Avenue, Lancaster, New York 14086

Tel: 716/685-8080, 800/327-6534 • Fax: 716/685-0852 • Email: asc@ene.com



November 30, 2004

Jan Barbas
Parsons Engineering Science, Inc.
406 W. South Jordan Pkwy.
Suite 300
South Jordan, Utah 840953944

RE: Tooele RCRA Phase II

Work Order No.: **0411068**

Dear Jan Barbas,

Analytical Services Center received 5 samples on Thursday, November 04, 2004 for the analyses presented in the following report.

The ASC certifies that the test results in this report meet all requirements of NELAC for which it holds certification except as noted in this narrative and/or as flagged in the report.

The ASC is accredited in the Fields of Testing Potable water (SDWA), Solid and Chemical Materials (Solid Hazardous Wastes, RCRA), Water (CWA and other non-potable water) and Air and Emissions. Its primary accrediting authorities are New York State Department of Health and Florida Department of Health. The particular analytes/methods certified may be ascertained by requesting the laboratory's current certificates from your laboratory Project Manager.

You will receive an invoice under separate cover.

E & E will retain the samples addressed in this report for 30 days, unless otherwise instructed by the client. If additional storage is requested, the storage fee is \$1.00 per sample container per month, to accrue until the client authorizes sample destruction.

This report is not to be reproduced, except in full, without the written approval of the laboratory.

Sincerely,

Tony Bogolin

Project Manager

CC:

Enclosures as noted



Analytical Services Center
International Specialists in Environmental Analysis
Lancaster, New York 14086-
Phone: (716) 685-8080 Fax: (716) 685-0852

Laboratory Results

NYS ELAP ID#: 10486

CLIENT: Parsons Engineering Science, Inc.
Project: Tooele RCRA Phase II
Lab Order: 0411068
Date Received: 11/4/2004

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Alt. Client Id	Collection Date
0411068-01A	IDW13		11/3/2004 2:22:00 PM
0411068-02A	IDW14		11/3/2004 2:46:00 PM
0411068-03A	IDW15		11/3/2004 2:50:00 PM
0411068-04A	IDW16		11/3/2004 2:56:00 PM
0411068-05A	IDW17		11/3/2004 3:00:00 PM



Analytical Services Center

International Specialists in Environmental Analysis

4493 Walden Avenue

Lancaster, New York 14086

Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Client: PARSONS ENGINEERING SCIENCE, INC.

Project: Tooele RCRA Phase II

Lab Order: 0411068

CASE NARRATIVE

GCMS VOLATILES

A DB 624 or equivalent column and a trap packed with OV-1, Tenax, silica gel and activated charcoal was used for the volatile analysis.

TCLP analysis

All samples were analyzed within hold time.

Calibration and Tunes

All initial and continuing calibrations were acceptable.

QC

All surrogate recoveries were within acceptable limits.

All blank analyses were acceptable.

All laboratory control sample/laboratory control sample duplicate (LCS/LCSD) recoveries and RPD values were acceptable.

All internal standard area responses were acceptable.

Tony Bogolin

Project Manager

November 30, 2004



Analytical Services Center
 International Specialists in Environmental Analysis
 Lancaster, New York 14086-
 Phone: (716) 685-8080 Fax: (716) 685-0852

Laboratory Results

NYS ELAP ID#: 10486
 Phone: (716) 685-8080

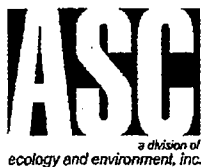
Order: 0411068
 Client: Parsons Engineering Science, Inc.
 Project: Tooele RCRA Phase II

DATES SUMMARY REPORT

B) Sample ID (CLIENT)	Matrix	Test Name	Collection Date	Received Date	HT (Days) / HT Expire	Analyzed* - Analysis/BatchID	Type DF	#Analytes	Fl
068-01A	IDW13	TCLP Ext for VOCs by M 1311	11/3/2004 2:22:00 PM	11/4/2004 9:10:00 AM	14:C 11/17/2004 2:22:00 PM	11/8/2004 9:08:12 AM 200404355	NA NA	NA	[
		TCLP Volatile Organic Compounds by Method 8260B			14:T 11/24/2004 4:56:30 PM	11/23/2004 11:19:00 AM 1067578	SAMP 10	10	[
B) Sample ID (CLIENT)	Matrix	Test Name	Collection Date	Received Date	HT (Days) / HT Expire	Analyzed* - Analysis/BatchID	Type DF	#Analytes	Fl
068-02A	IDW14	TCLP Ext for VOCs by M 1311	11/3/2004 2:46:00 PM	11/4/2004 9:10:00 AM	14:C 11/17/2004 2:46:00 PM	11/8/2004 9:08:12 AM 200404355	NA NA	NA	[
		TCLP Volatile Organic Compounds by Method 8260B			14:T 11/24/2004 4:56:30 PM	11/23/2004 11:49:00 AM 1067579	SAMP 10	10	[
B) Sample ID (CLIENT)	Matrix	Test Name	Collection Date	Received Date	HT (Days) / HT Expire	Analyzed* - Analysis/BatchID	Type DF	#Analytes	Fl
068-03A	IDW15	TCLP Ext for VOCs by M 1311	11/3/2004 2:50:00 PM	11/4/2004 9:10:00 AM	14:C 11/17/2004 2:50:00 PM	11/8/2004 9:08:12 AM 200404355	NA NA	NA	[
		TCLP Volatile Organic Compounds by Method 8260B			14:T 11/24/2004 4:56:30 PM	11/23/2004 12:19:00 PM 1067580	SAMP 10	10	[
B) Sample ID (CLIENT)	Matrix	Test Name	Collection Date	Received Date	HT (Days) / HT Expire	Analyzed* - Analysis/BatchID	Type DF	#Analytes	Fl
068-04A	IDW16	TCLP Ext for VOCs by M 1311	11/3/2004 2:56:00 PM	11/4/2004 9:10:00 AM	14:C 11/17/2004 2:56:00 PM	11/8/2004 9:08:12 AM 200404355	NA NA	NA	[
		TCLP Volatile Organic Compounds by Method 8260B			14:T 11/24/2004 4:56:30 PM	11/23/2004 12:48:00 PM 1067581	SAMP 10	10	[
B) Sample ID (CLIENT)	Matrix	Test Name	Collection Date	Received Date	HT (Days) / HT Expire	Analyzed* - Analysis/BatchID	Type DF	#Analytes	Fl
068-05A	IDW17	TCLP Ext for VOCs by M 1311	11/3/2004 3:00:00 PM	11/4/2004 9:10:00 AM	14:C 11/17/2004 3:00:00 PM	11/8/2004 9:08:12 AM 200404355	NA NA	NA	[
		TCLP Volatile Organic Compounds by Method 8260B			14:T 11/24/2004 4:56:30 PM	11/23/2004 1:18:00 PM 1067574	SAMP 10	10	[

From: C-Collection / R- Receipt(VTSR) / P-Prep / T-TCLP Prep

"Analyzed" reflects the analysis date and time or injection time for analytical tests. For preparation tests "Analyzed" reflects the start of the preparation except when "AFCEE criteria used"; flag indicates date time of completion of the preparation.
 TCLP/SPLP Extractions and subsequent preparation tests..."Analyzed" reflects the date of TCLP/SPLP Extraction/preparation. For Re-extracted (RE) samples: Preparation tests completed dates reflects extraction from the original sample leachate unless an "RE" Sample exists for the extraction (tumble) test.



Analytical Services Center

International Specialists in Environmental Analysis

Lancaster, New York 14086-

Phone: (716) 685-8080 Fax: (716) 685-0852

Laboratory Results

NYS ELAP ID#: 10486

Client: Parsons Engineering Science, Inc.

Project: Tooele RCRA Phase II

Work Order: 0411068

Method References

GCMS Volatiles

TCLP VOCs by Method 8260B

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. 3rd ed. 1986. Volumes 1A, 1B, 1C & Volume 2. (Includes all Updates). U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response.

SAMPLE RECEIPT RECORDS

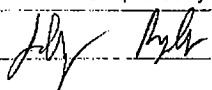
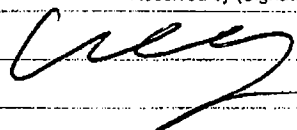
CHAIN OF CUSTODY PARSONS COC ID: 816	Project Name:	Tooele Industrial Area	Contractor:	Parsons - SLC	Parsons Point of Contact: Jan Barbas
	Project Manager:	Ed Staes	Installation:	TEAD	406 W. South Jordan Parkway Suite 300 South Jordan, Utah 84095
	Sample Coordinator:	Jeff Bigelow	Sample Program:	Shallow Soil Sampling	(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
	IDW13	IDW13	SD	G	N	1	11-3-04	14:22	JJB			1
Analysis		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOCTCLP		ECEN	5	1								

Low Sample for containers

PARSN20430501-05 ~~4~~

Well C-41

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
	11-3-04 18:00		11/4/04 0800

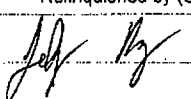
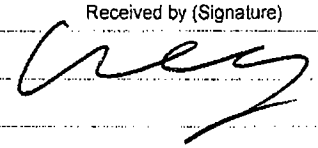
CHAIN OF CUSTODY PARSONS COC ID: 817	Project Name:	Tooele Industrial Area	Contractor:	Parsons - SLC	Parsons Point of Contact: Jan Barbas
	Project Manager:	Ed Staes	Installation:	TEAD	Suite 300
	Sample Coordinator:	Jeff Bigelow	Sample Program:	Shallow Soil Sampling	South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
	IDW14	IDW14	SD	G	N	1	11-3-04	14:46	JJB			1
Analysis		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOCTCLP		ECEN	5	1								

Ibw sample for condimers;

PARSN20430506-10

Well C-41

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
	11-3-04 18:00		11/4/04 09:10

CHAIN OF CUSTODY PARSONS COC ID: 818	Project Name:	Tooele Industrial Area	Contractor:	Parsons - SLC	Parsons Point of Contact: Jan Barbas 406 W. South Jordan Parkway
	Project Manager:	Ed Staes	Installation:	TEAD	Suite 300 South Jordan, Utah 84095
	Sample Coordinator:	Jeff Bigelow	Sample Program:	Shallow Soil Sampling	(801) 572-5999 FAX (801) 572-9069

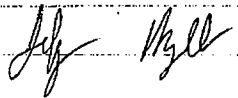
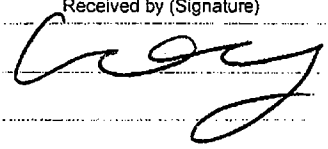
Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
	IDW15	IDW15	SD	G	N	1	11-3-04	14:50	JJB			1
Analysis		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOCTCLP		ECEN	5	1								

IDW sample for containers:

PARSIN20430511
and

PARSIN20430601-04

well C-41

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
	11-3-04 18:00		11/4/04 0910

CHAIN OF CUSTODY

PARSONS

COC ID: 819

Project Name: Tooele Industrial Area

Contractor: Parsons - SLC

Parsons Point of Contact: Jan Barbas
406 W. South Jordan Parkway

Project Manager: Ed Staes

Installation: TEAD

Suite 300
South Jordan, Utah 84095

Sample Coordinator: Jeff Bigelow

Sample Program: Shallow Soil Sampling

(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
	IDW16	IDW16	SD	G	N	1	11-3-04	14:58	JJB			1
Analysis		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOCTCLP		ECEN	5	1								

IDW sample for condensers!

PARSIV20430605-09

Well C-41

Relinquished by (Signature)

[Signature]

Date/Time

11-3-04 18:00

Received by (Signature)

[Signature]

Date/Time

11/4/04 0910

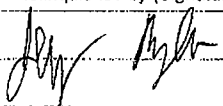
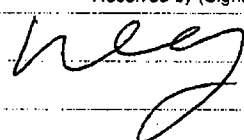
CHAIN OF CUSTODY PARSONS COC ID: 820	Project Name:	Tooele Industrial Area	Contractor:	Parsons - SLC	Parsons Point of Contact: Jan Barbas
	Project Manager:	Ed Staes	Installation:	TEAD	Suite 300
	Sample Coordinator:	Jeff Bigelow	Sample Program:	Shallow Soil Sampling	South Jordan, Utah 84095 (801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
	IDW17	IDW17	SD	G	N	1	11-3-04	15:00	JJB			1
Analysis		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOCTCLP		ECEN	5	1								

IDW Sample for condurren

PARSN20430610-12

Well C-41

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
	11-3-04 18:00		11/4/04 0910



Cooler Receipt Form

No. of Packages:	1	Date Received:	11/4/04
Package Receipt No.:	14906	Project or Site Name:	
Client:	Persons		

A. Preliminary Examination and Receipt Phase		Circle One		
1. Did coolers come with airbill or packing slip?	Yes <input checked="" type="radio"/> No <input type="radio"/> NA <input type="radio"/>	Yes	No	NA
Circle carrier here and print airbill number below. Fed Ex <input checked="" type="radio"/> Airborne <input type="radio"/> Client <input type="radio"/> Other <input type="radio"/>				
Shipped as high hazard or dangerous goods?		Yes <input checked="" type="radio"/> No <input type="radio"/> NA <input type="radio"/>		
2. Did cooler(s) have custody seals?	Yes <input checked="" type="radio"/> No <input type="radio"/> NA <input type="radio"/>	Yes	No	NA
3. Were custody seals unbroken and intact on receipt?	Yes <input checked="" type="radio"/> No <input type="radio"/> NA <input type="radio"/>	Yes	No	NA
4. Were custody seals dated and signed?	Yes <input checked="" type="radio"/> No <input type="radio"/> NA <input type="radio"/>	Yes	No	NA
5. How was package secured?	<input type="checkbox"/> Not secured <input type="checkbox"/> Fiberglass Tape <input checked="" type="checkbox"/> Tape			

B. Unpacking Phase					
6. Date cooler(s) opened: 11/4/04	Cooler(s) opened by: [Signature]				
7. Was a temperature blank vial included inside cooler(s)?	Yes <input checked="" type="radio"/> No <input type="radio"/> NA <input type="radio"/>				
Please Record Temperature Vial or Cooler Temperature for Each Cooler, Range (2° - 6°C)*					
Airbill No.	Temp. °C	Airbill No.	Temp. °C	Airbill No.	Temp. °C
8457 2785 4174	4.0				
Thermometer No.: 231	Correction Factor: 0	*If temperature is outside of acceptable range, prepare a PM Notification form indicating affected containers.			
8. Were the C-O-C forms received?	Yes <input checked="" type="radio"/> No <input type="radio"/> NA <input type="radio"/>	Yes	No	NA	
C-O-C forms numbers if present:					
9. Was enough packing material used in cooler(s)?	Yes <input checked="" type="radio"/> No <input type="radio"/> NA <input type="radio"/>	Yes	No	NA	
Type of material: <input type="checkbox"/> Vermiculite <input checked="" type="checkbox"/> Bubble Wrap <input type="checkbox"/> Other					
10. If cooling was required, what was the means (type ice) of cooling used?	Wet <input checked="" type="checkbox"/> Dry <input type="checkbox"/> Blue <input type="checkbox"/> Other				NA
11. Were all containers sealed in separate plastic bags?	Yes <input checked="" type="radio"/> No <input type="radio"/> NA <input type="radio"/>	Yes	No	NA	
12. Did all containers arrive unbroken and in good condition?	Yes <input checked="" type="radio"/> No <input type="radio"/> NA <input type="radio"/>	Yes	No	NA	
13. Interim storage area if not logged:					
In: Date	Time	Signature			
Out: Date	Time	Signature			

C. Login Phase	
Samples Logged in By Signature: [Signature]	Date: 11/4/04
14. Were all container labels complete (e.g. date, time preserved)?	Yes <input checked="" type="radio"/> No <input type="radio"/> NA <input type="radio"/>
15. Were all C-O-C forms filled out properly in black ink and signed?	Yes <input checked="" type="radio"/> No <input type="radio"/> NA <input type="radio"/>
16. Did the C-O-C form agree with containers received?	Yes <input checked="" type="radio"/> No <input type="radio"/> NA <input type="radio"/>
17. Were the correct containers used for the tests requested?	Yes <input checked="" type="radio"/> No <input type="radio"/> NA <input type="radio"/>
18. Were the correct preservatives listed on the sample labels?	Yes <input checked="" type="radio"/> No <input type="radio"/> NA <input type="radio"/>
19. Was a sufficient sample volume sent for the tests requested?	Yes <input checked="" type="radio"/> No <input type="radio"/> NA <input type="radio"/>
20. Were all volatile samples received without headspace?	Yes <input checked="" type="radio"/> No <input type="radio"/> NA <input checked="" type="radio"/>

RESULTS SUMMARY

**Analytical Services Center**

International Specialists in Environmental Analysis

4493 Walden Avenue

Lancaster, New York 14086

Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Client: Parsons Engineering Science, Inc.**Client Sample ID:** IDW13**Lab Order:** 0411068**Alt. Client ID:****Project:** Tooele RCRA Phase II**Collection Date:** 11/3/2004 2:22:00 PM % Moist:**Lab ID:** 0411068-01A**Sample Type:** SAMP**Matrix:** Soil**Test Code:** 1_1311_8260B_L**TCLP VOLATILE ORGANIC COMPOUNDS BY METHOD 8260B****Method:** SW8260B**Prep Method:** SW1311

Analyte	Result	Q	RL	Units	DF	Date Analyzed	Run Batch ID	Analyst
1,1-Dichloroethene	ND		0.0500	mg/L	10	11/23/2004 11:19:00 AM	NILES_041123A	DWW
1,2-Dichloroethane	ND		0.0500	mg/L	10			
2-Butanone	ND		0.100	mg/L	10			
Benzene	ND		0.0500	mg/L	10			
Carbon tetrachloride	ND		0.0500	mg/L	10			
Chlorobenzene	ND		0.0500	mg/L	10			
Chloroform	ND		0.0500	mg/L	10			
Tetrachloroethene	ND		0.0500	mg/L	10			
Trichloroethene	ND		0.0500	mg/L	10			
Vinyl chloride	ND		0.100	mg/L	10			
Surr:1,2-Dichloroethane-d4	86		82 - 124	%REC	10	11/23/2004 11:19:00 AM	NILES_041123A	DWW
Surr:4-Bromofluorobenzene	103		87 - 115	%REC	10			
Surr:Toluene-d8	101		85 - 115	%REC	10			

Definitions:

* - Recovery outside QC limits

DF - Dilution Factor

H - Value Exceeds Maximum Contaminant Level

N - Single Column Analysis

NP - Petroleum Pattern is not present

B - Analyte found in Method blank

DNI - Did not Ignite

J - Estimated value

NC - Not Calculated

P - Post Spike Recovery outside limits

D - Diluted due to matrix or extended target compounds

E - Result above quantitation limit (high standard or ICP linear range).

M - Matrix Spike Recovery outside limits

ND - Not Detected at the Reporting Limit

R - RPD outside recovery limits



Analytical Services Center
International Specialists in Environmental Analysis
4493 Walden Avenue
Lancaster, New York 14086

Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Client: Parsons Engineering Science, Inc.

Client Sample ID: IDW14

Lab Order: 0411068

Alt. Client ID:

Project: Tooele RCRA Phase II

Collection Date: 11/3/2004 2:46:00 PM % Moist:

Lab ID: 0411068-02A

Sample Type: SAMP

Matrix: Soil

Test Code: 1_1311_8260B_L

TCLP VOLATILE ORGANIC COMPOUNDS BY METHOD 8260B

Method: SW8260B

Prep Method: SW1311

Analyte	Result	Q	RL	Units	DF	Date Analyzed	Run Batch ID	Analyst
1,1-Dichloroethene	ND		0.0500	mg/L	10	11/23/2004 11:49:00 AM	NILES_041123A	DWW
1,2-Dichloroethane	ND		0.0500	mg/L	10			
2-Butanone	ND		0.100	mg/L	10			
Benzene	ND		0.0500	mg/L	10			
Carbon tetrachloride	ND		0.0500	mg/L	10			
Chlorobenzene	ND		0.0500	mg/L	10			
Chloroform	ND		0.0500	mg/L	10			
Tetrachloroethene	ND		0.0500	mg/L	10			
Trichloroethene	ND		0.0500	mg/L	10			
Vinyl chloride	ND		0.100	mg/L	10			
Surr:1,2-Dichloroethane-d4	87		82 - 124	%REC	10	11/23/2004 11:49:00 AM	NILES_041123A	DWW
Surr:4-Bromofluorobenzene	101		87 - 115	%REC	10			
Surr:Toluene-d8	102		85 - 115	%REC	10			

Definitions:

* - Recovery outside QC limits

DF - Dilution Factor

H - Value Exceeds Maximum Contaminant Level

N - Single Column Analysis

NP - Petroleum Pattern is not present

B - Analyte found in Method blank

DNI - Did not Ignite

J - Estimated value

NC - Not Calculated

P - Post Spike Recovery outside limits

D - Diluted due to matrix or extended target compounds

E - Result above quantitation limit (high standard or ICP linear range).

M - Matrix Spike Recovery outside limits

ND - Not Detected at the Reporting Limit

R - RPD outside recovery limits

**Analytical Services Center**

International Specialists in Environmental Analysis

4493 Walden Avenue

Lancaster, New York 14086

Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Client: Parsons Engineering Science, Inc.**Client Sample ID:** IDW15**Lab Order:** 0411068**Alt. Client ID:****Project:** Tooele RCRA Phase II**Collection Date:** 11/3/2004 2:50:00 PM % Moist:**Lab ID:** 0411068-03A**Sample Type:** SAMP**Matrix:** Soil**Test Code:** 1_1311_8260B_L**TCLP VOLATILE ORGANIC COMPOUNDS BY METHOD 8260B****Method:** SW8260B**Prep Method:** SW1311

Analyte	Result	Q	RL	Units	DF	Date Analyzed	Run Batch ID	Analyst
1,1-Dichloroethene	ND		0.0500	mg/L	10	11/23/2004 12:19:00 PM	NILES_041123A	DWW
1,2-Dichloroethane	ND		0.0500	mg/L	10			
2-Butanone	ND		0.100	mg/L	10			
Benzene	ND		0.0500	mg/L	10			
Carbon tetrachloride	ND		0.0500	mg/L	10			
Chlorobenzene	ND		0.0500	mg/L	10			
Chloroform	ND		0.0500	mg/L	10			
Tetrachloroethene	ND		0.0500	mg/L	10			
Trichloroethene	ND		0.0500	mg/L	10			
Vinyl chloride	ND		0.100	mg/L	10			
Surr:1,2-Dichloroethane-d4	88		82 - 124	%REC	10	11/23/2004 12:19:00 PM	NILES_041123A	DWW
Surr:4-Bromofluorobenzene	99		87 - 115	%REC	10			
Surr:Toluene-d8	100		85 - 115	%REC	10			

Definitions:

* - Recovery outside QC limits

DF - Dilution Factor

H - Value Exceeds Maximum Contaminant Level

N - Single Column Analysis

NP - Petroleum Pattern is not present

B - Analyte found in Method blank

DNI - Did not Ignite

J - Estimated value

NC - Not Calculated

P - Post Spike Recovery outside limits

D - Diluted due to matrix or extended target compounds

E - Result above quantitation limit (high standard or ICP linear range).

M - Matrix Spike Recovery outside limits

ND - Not Detected at the Reporting Limit

R - RPD outside recovery limits

**Analytical Services Center**

International Specialists in Environmental Analysis

4493 Walden Avenue

Lancaster, New York 14086

Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Client: Parsons Engineering Science, Inc.**Client Sample ID:** IDW16**Lab Order:** 0411068**Alt. Client ID:****Project:** Tooele RCRA Phase II**Collection Date:** 11/3/2004 2:56:00 PM % Moist:**Lab ID:** 0411068-04A**Sample Type:** SAMP**Matrix:** Soil**Test Code:** 1_1311_8260B_L**TCLP VOLATILE ORGANIC COMPOUNDS BY METHOD 8260B****Method:** SW8260B**Prep Method:** SW1311

Analyte	Result	Q	RL	Units	DF	Date Analyzed	Run Batch ID	Analyst
1,1-Dichloroethene	ND		0.0500	mg/L	10	11/23/2004 12:48:00 PM	NILES_041123A	DWW
1,2-Dichloroethane	ND		0.0500	mg/L	10			
2-Butanone	ND		0.100	mg/L	10			
Benzene	ND		0.0500	mg/L	10			
Carbon tetrachloride	ND		0.0500	mg/L	10			
Chlorobenzene	ND		0.0500	mg/L	10			
Chloroform	ND		0.0500	mg/L	10			
Tetrachloroethene	ND		0.0500	mg/L	10			
Trichloroethene	ND		0.0500	mg/L	10			
Vinyl chloride	ND		0.100	mg/L	10			
Surr:1,2-Dichloroethane-d4	89		82 - 124	%REC	10	11/23/2004 12:48:00 PM	NILES_041123A	DWW
Surr:4-Bromofluorobenzene	100		87 - 115	%REC	10			
Surr:Toluene-d8	102		85 - 115	%REC	10			

Definitions:

* - Recovery outside QC limits

DF - Dilution Factor

H - Value Exceeds Maximum Contaminant Level

N - Single Column Analysis

NP - Petroleum Pattern is not present

B - Analyte found in Method blank

DNI - Did not Ignite

J - Estimated value

NC - Not Calculated

P - Post Spike Recovery outside limits

D - Diluted due to matrix or extended target compounds

E - Result above quantitation limit (high standard or ICP linear range).

M - Matrix Spike Recovery outside limits

ND - Not Detected at the Reporting Limit

R - RPD outside recovery limits

**Analytical Services Center**

International Specialists in Environmental Analysis

4493 Walden Avenue

Lancaster, New York 14086

Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Client: Parsons Engineering Science, Inc.**Client Sample ID:** IDW17**Lab Order:** 0411068**Alt. Client ID:****Project:** Tooele RCRA Phase II**Collection Date:** 11/3/2004 3:00:00 PM **% Moist:****Lab ID:** 0411068-05A**Sample Type:** SAMP**Matrix:** Soil**Test Code:** 1_1311_8260B_L**TCLP VOLATILE ORGANIC COMPOUNDS BY METHOD 8260B****Method:** SW8260B**Prep Method:** SW1311

Analyte	Result	Q	RL	Units	DF	Date Analyzed	Run Batch ID	Analyst
1,1-Dichloroethene	ND		0.0500	mg/L	10	11/23/2004 1:18:00 PM	NILES_041123A	DWW
1,2-Dichloroethane	ND		0.0500	mg/L	10			
2-Butanone	ND		0.100	mg/L	10			
Benzene	ND		0.0500	mg/L	10			
Carbon tetrachloride	ND		0.0500	mg/L	10			
Chlorobenzene	ND		0.0500	mg/L	10			
Chloroform	ND		0.0500	mg/L	10			
Tetrachloroethene	ND		0.0500	mg/L	10			
Trichloroethene	ND		0.0500	mg/L	10			
Vinyl chloride	ND		0.100	mg/L	10			
Surr:1,2-Dichloroethane-d4	88		82 - 124	%REC	10	11/23/2004 1:18:00 PM	NILES_041123A	DWW
Surr:4-Bromofluorobenzene	99		87 - 115	%REC	10			
Surr:Toluene-d8	101		85 - 115	%REC	10			

Definitions:

* - Recovery outside QC limits

DF - Dilution Factor

H - Value Exceeds Maximum Contaminant Level

N - Single Column Analysis

NP - Petroleum Pattern is not present

B - Analyte found in Method blank

DNI - Did not Ignite

J - Estimated value

NC - Not Calculated

P - Post Spike Recovery outside limits

D - Diluted due to matrix or extended target compounds

E - Result above quantitation limit (high standard or ICP linear range).

M - Matrix Spike Recovery outside limits

ND - Not Detected at the Reporting Limit

R - RPD outside recovery limits

APPENDIX H

Memorandum

To: Dean Reynolds, TEAD; Larry McFarland, TEAD
Copy: Maryellen Mackenzie, USACE; Carl Cole, USACE; Doug Mackenzie, USACE; Richard Jirik, Parsons
From: Jan Barbas, Parsons
Date: Thursday, December 23, 2004
Subject: TEAD SWMU-58 RFI - Waste Management

This letter is to recommend disposition of the contents of the 6500 gallon Baker Tank summarized in Table One, attached.

One sample of the contents was taken, labeled IDW21. IDW21 was analyzed for total VOCs. Analysis was conducted by Ecology and Environment, Inc, Lancaster NY, a Utah Certified laboratory.

Results have been received as data packages and electronic data deliverables. Parsons has reviewed the data and found QC to be acceptable. Analytical results and case narrative are attached in portable document format.

Listed Wastes Analysis:

Trichloroethene at 155 µg/L, tetrachloroethene at 1.09 µg/L, chloroform at 0.167 µg/L, and carbon tetrachloride at 0.761 µg/L were detected in IDW21. Therefore it is recommended that the waste be coded as F001 and F002 hazardous.

Characteristic Wastes Analysis:

The waste is known to be primarily water. Therefore generator's reasonable knowledge may be used to exclude the characteristics of ignitability, reactivity and corrosivity.

No constituents were detected in excess of TCLP limits. Therefore no characteristic waste codes (40 CFR Part 261.24) should be applied.

Disposition:

Parsons recommends that this waste be disposed of in TEAD's treatment facility.

Parsons will arrange to dispose of the waste per your written instructions.

Table One

[illegible]

From: McFarland, Larry [mailto:larry.mcfarland@us.army.mil]

Sent: Tuesday, January 04, 2005 2:54 PM

To: Kubacki, Steve

Cc: Jirik, Richard

Subject: Processing SWMU 58 Well Development Water

Steve,

As we discussed on the phone earlier, Tooele Army Depot has determined that the well development water generated during the SWMU 58 investigation, that is stored in the 6500 gallon Baker tanks in Parsons 90 day yard, can be processed through the ground water treatment plant. Constituent detected in the water include Trichloroethene at 155 µg/L, tetrachloroethene at 1.09 µg/L, chloroform at 0.167 µg/L, and carbon tetrachloride at 0.761 µg/L, all of which we are permitted for treatment through the system. Attached for your reference is a copy of the analytical report for samples collected from the tank. Parsons would like to transfer the water to the treatment plant on January 5th. Richard Jirik will contact you to coordinate the transfer.

Thanks

Larry McFarland

Environmental Office, SJMTE-CS-EO

1 Tooele Army Depot, Building 8

Tooele, Utah 84074-5003

Phone (435) 833-3235 Fax (435) 833-2839

larry.mcfarland@us.army.mil

mcfarlal@emh2.tooele.army.mil



analytical services center

International Specialists in Environmental Analysis

4493 Walden Avenue, Lancaster, New York 14086

Tel: 716/685-8080, 800/327-6534 • Fax: 716/685-0852 • Email: asc@ene.com



December 21, 2004

Jan Barbas
Parsons Engineering Science, Inc.
406 W. South Jordan Pkwy.
Suite 300
South Jordan, Utah 840953944

RE: Tooele RCRA Phase II

Work Order No.: **0412033**

Dear Jan Barbas,

Analytical Services Center received 2 samples on Thursday, December 02, 2004 for the analyses presented in the following report.

The ASC certifies that the test results in this report meet all requirements of NELAC for which it holds certification except as noted in this narrative and/or as flagged in the report.

The ASC is accredited in the Fields of Testing Potable water (SDWA), Solid and Chemical Materials (Solid Hazardous Wastes, RCRA), Water (CWA and other non-potable water) and Air and Emissions. Its primary accrediting authorities are New York State Department of Health and Florida Department of Health. The particular analytes/methods certified may be ascertained by requesting the laboratory's current certificates from your laboratory Project Manager.

You will receive an invoice under separate cover.

E & E will retain the samples addressed in this report for 30 days, unless otherwise instructed by the client. If additional storage is requested, the storage fee is \$1.00 per sample container per month, to accrue until the client authorizes sample destruction.

This report is not to be reproduced, except in full, without the written approval of the laboratory.

Sincerely,

Tony Bogolin

Project Manager

CC:

Enclosures as noted



Analytical Services Center
International Specialists in Environmental Analysis
Lancaster, New York 14086-
Phone: (716) 685-8080 Fax: (716) 685-0852

Laboratory Results

NYS ELAP ID#: 10486

CLIENT: Parsons Engineering Science, Inc.
Project: Tooele RCRA Phase II
Lab Order: 0412033
Date Received: 12/2/2004

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Alt. Client Id	Collection Date
0412033-01A	IDW21		12/1/2004 8:15:00 AM
0412033-02A	IDWTB5		12/1/2004 8:15:00 AM



Analytical Services Center

International Specialists in Environmental Analysis

4493 Walden Avenue

Lancaster, New York 14086

Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Client: PARSONS ENGINEERING SCIENCE, INC.
Project: Tooele RCRA Phase II
Lab Order: 0412033

CASE NARRATIVE

Trip Blank (IDWTB5) analysis was cancelled by Jan Barbas on December 3, 2004.

GCMS VOLATILES

A DB 624 column and a trap packed with OV-1, Tenax, silica gel and activated charcoal was used for the volatile analysis.

Sample Analysis

All aqueous volatile samples were determined to be at a pH of 1.

All samples were analyzed within hold time.

Sample IDW21 was analyzed at a secondary dilution due to the elevated level of trichloroethene present. Both sets of data have been reported.

Calibration and Tunes

All initial and continuing calibrations were acceptable.

There were no manual integrations required.

QC

All surrogate recoveries were within acceptable limits.

All blank analyses were acceptable.

All laboratory control sample (LCS) recoveries were acceptable.

All internal standard area responses were acceptable.

Tony Bogolin

Project Manager

December 21, 2004



Analytical Services Center
International Specialists in Environmental Analysis
Lancaster, New York 14086-
Phone: (716) 685-8080 Fax: (716) 685-0852

Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Order: 0412033
Client: Parsons Engineering Science, Inc.
Project: Tooele RCRA Phase II

DATES SUMMARY REPORT

B) Sample ID (CLIENT)	Matrix	Test Name	Collection Date	Received Date	HT (Days) / HT Expire	Analyzed* - Analysis/BatchID	Type	DF	#Analytes	FI
033-01A IDW21	Water	Low Level VOCs by Method 8260B	12/1/2004 8:15:00 AM	12/2/2004 9:04:00 AM	14:C 12/15/2004 8:15:00 AM	12/8/2004 9:37:00 AM 1080095	SAMP	1	21	[

From: C-Collection / R- Receipt(VTSR) / P-Prep / T-TCLP Prep

"Analyzed" reflects the analysis date and time or injection time for analytical tests. For preparation tests "Analyzed" reflects the start of the preparation except when "AFCEE criteria used"; flag indicates date time of completion of the preparation.

TCLP/SPLP Extractions and subsequent preparation tests..."Analyzed" reflects the date of TCLP/SPLP Extraction/preparation. For Re-extracted (RE) samples: Preparation tests completed dates reflects extraction from the original sample leachate unless an "RE" Sample exists for the extraction (tumble) test.



Analytical Services Center
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Lancaster, New York 14086-
Phone: (716) 685-8080 Fax: (716) 685-0852

Laboratory Results

NYS ELAP ID#: 10486

Client: Parsons Engineering Science, Inc.
Project: Tooele RCRA Phase II
Work Order: 0412033

Method References

GCMS Volatiles

Parsons, Tooele - VOCs, Low Level by GCMS Method
8260B

Test Methods for Evaluating Solid Waste: Physical/Chemical
Methods. 3rd ed. 1986. Volumes.1A, 1B, 1C & Volume 2. (Includes
all Updates). U.S. Environmental Protection Agency, Office of Solid
Waste and Emergency Response.

SAMPLE RECEIPT RECORDS

CHAIN OF CUSTODY PARSONS COC ID: 920	Project Name:	Tooele Industrial Area	Contractor:	Parsons - SLC	Parsons Point of Contact: Jan Barbas
	Project Manager:	Ed Staes	Installation:	TEAD	406 W. South Jordan Parkway Suite 300 South Jordan, Utah 84095
	Sample Coordinator:	Jeff Bigelow	Sample Program:	Shallow Soil Sampling	(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
	IDW21	IDW21	WW	B	N	1	12-1-04	08:15	JJB	-	-	3
	Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		ECEN	12-1-04	3			01120401					

IDW Sample

for container. PARSON20430401

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
<i>[Signature]</i> 70 FAD EX	01 DEC 04 / 1000	<i>[Signature]</i>	12/2/04 0804

CHAIN OF CUSTODY

PARSONS

COC ID: 921

Project Name: Tooele Industrial Area

Project Manager: Ed Staes

Sample Coordinator: Jeff Bigelow

Contractor: Parsons - SLC

Installation: TEAD

Sample Program: Shallow Soil Sampling

Parsons Point of Contact: Jan Barbas
406 W. South Jordan Parkway

Suite 300
South Jordan, Utah 84095

(801) 572-5999 FAX (801) 572-9069


Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
	IDWTB5	IDWTB5	WQ	NA	TB	1	12-1-04	08:15	JTB	-	-	1
Analysis		Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot	Remarks:				
VOC		ECEN	12-1-04	1								

Relinquished by (Signature)

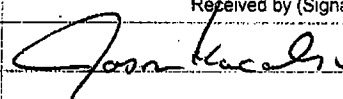
Date/Time

Received by (Signature)

Date/Time

 TO F&D EX

01 DEC 04 / 1000



12/2/04 0904



Cooler Receipt Form

No. of Packages:	1	Date Received:	12-2-04
Package Receipt No.:	15125	Project or Site Name:	Tooch
Client:	Parsons		

A. Preliminary Examination and Receipt Phase		Circle One		
1. Did coolers come with airbill or packing slip?		Yes	No	NA
Circle carrier here and print airbill number below: <u>Fed Ex</u> Airborne Client Other _____				
Shipped as high hazard or dangerous goods?		Yes	No	NA
2. Did cooler(s) have custody seals?		Yes	No	NA
3. Were custody seals unbroken and intact on receipt?		Yes	No	NA
4. Were custody seals dated and signed?		Yes	No	NA
5. How was package secured?	<input type="checkbox"/> Not secured <input type="checkbox"/> Fiberglass Tape <input checked="" type="checkbox"/> Plastic			

B. Unpacking Phase					
6. Date cooler(s) opened: <u>12-2-04</u>	Cooler(s) opened by: <u>[Signature]</u>				
7. Was a temperature blank vial included inside cooler(s)?	Yes No NA				
Please Record Temperature Vial or Cooler Temperature for Each Cooler, Range (2° - 6°C)*					
Vial No.	Temp. °C	Vial No.	Temp. °C	Vial No.	Temp. °C
7921 4854 4397	2°				
Thermometer No.: <u>231</u>	Correction Factor: <u>0</u>	*If temperature is outside of acceptable range, prepare a PM Notification form indicating affected containers.			
8. Were the C-O-C forms received?		Yes	No	NA	
C-O-C forms numbers if present:					
9. Was enough packing material used in cooler(s)?		Yes	No	NA	
Type of material: <input type="checkbox"/> Vermiculite <input checked="" type="checkbox"/> Bubble Wrap <input type="checkbox"/> Other _____					
10. If cooling was required, what was the means (type ice) of cooling used:	<input checked="" type="checkbox"/> Wet <input type="checkbox"/> Dry <input type="checkbox"/> Blue <input type="checkbox"/> Other				NA
11. Were all containers sealed in separate plastic bags?		Yes	No	NA	
12. Did all containers arrive unbroken and in good condition?		Yes	No	NA	
13. Interim storage area if not logged:					
In: Date _____ Time _____ Signature _____					
Out: Date _____ Time _____ Signature _____					

C. Login Phase	
Samples Logged in By Signature: <u>D. Steinhilber</u>	Date: <u>12-2-04</u>
14. Were all container labels complete (e.g. date, time preserved)?	Yes No NA
15. Were all C-O-C forms filled out properly in black ink and signed?	Yes No NA
16. Did the C-O-C form agree with containers received?	Yes No NA
17. Were the correct containers used for the tests requested?	Yes No NA
18. Were the correct preservatives listed on the sample labels?	Yes No NA
19. Was a sufficient sample volume sent for the tests requested?	Yes No NA
20. Were all volatile samples received without headspace?	Yes No NA

RESULTS SUMMARY



Analytical Services Center
International Specialists in Environmental Analysis
4493 Walden Avenue
Lancaster, New York 14086

Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Client: Parsons Engineering Science, Inc.

Client Sample ID: IDW21

Lab Order: 0412033

Alt. Client ID:

Project: Tooele RCRA Phase II

Collection Date: 12/1/2004 8:15:00 AM % Moist:

Lab ID: 0412033-01A

Sample Type: SAMP

Matrix: Water

Test Code: C_8260B_5030B_LL_W_018

LOW LEVEL VOCs BY METHOD 8260B

Method: SW8260B

Prep Method: SW5030B_LL

Analyte	Result	Q	RL	Units	DF	Date Analyzed	Run Batch ID	Analyst
1,1,1-Trichloroethane	ND		1.00	µg/L	1	12/8/2004 9:37:00 AM	LINUS_041208A	DWW
1,1,2-Trichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethane	ND		1.00	µg/L	1			
1,1-Dichloroethene	ND		1.00	µg/L	1			
1,2-Dichloroethane	ND		1.00	µg/L	1			
1,2-Dichloropropane	ND		1.00	µg/L	1			
Benzene	ND		1.00	µg/L	1			
Carbon tetrachloride	0.761	J	1.00	µg/L	1			
Chloroethane	ND		1.00	µg/L	1			
Chloroform	0.167	J	1.00	µg/L	1			
cis-1,2-Dichloroethene	ND		1.00	µg/L	1			
Ethylbenzene	ND		1.00	µg/L	1			
m,p-Xylene	ND		1.00	µg/L	1			
Methylene chloride	ND		2.00	µg/L	1			
Naphthalene	ND		1.00	µg/L	1			
o-Xylene	ND		1.00	µg/L	1			
Tetrachloroethene	1.09		1.00	µg/L	1			
Toluene	ND		1.00	µg/L	1			
trans-1,2-Dichloroethene	ND		1.00	µg/L	1			
Trichloroethene	158	E	1.00	µg/L	1			
Vinyl chloride	ND		1.00	µg/L	1			
Surr:1,2-Dichloroethane-d4	101		70 - 130	%REC	1	12/8/2004 9:37:00 AM	LINUS_041208A	DWW
Surr:4-Bromofluorobenzene	92		70 - 130	%REC	1			
Surr:Toluene-d8	95		70 - 130	%REC	1			

Definitions:

* - Recovery outside QC limits

DF - Dilution Factor

H - Value Exceeds Maximum Contaminant Level

N - Single Column Analysis

NP - Petroleum Pattern is not present

B - Analyte found in Method blank

DNI - Did not Ignite

J - Estimated value

NC - Not Calculated

P - Post Spike Recovery outside limits

D - Diluted due to matrix or extended target compounds

E - Result above quantitation limit (high standard or ICP linear range).

M - Matrix Spike Recovery outside limits

ND - Not Detected at the Reporting Limit

R - RPD outside recovery limits



Analytical Services Center

International Specialists in Environmental Analysis

4493 Walden Avenue

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Laboratory Results

NYS ELAP ID#: 10486

Phone: (716) 685-8080

Client: Parsons Engineering Science, Inc.

Client Sample ID: IDW21

Lab Order: 0412033

Alt. Client ID:

Project: Tooele RCRA Phase II

Collection Date: 12/1/2004 8:15:00 AM % Moist:

Lab ID: 0412033-01A

Sample Type: DL

Matrix: Water

Test Code: C_8260B_5030B_LL_W_018

LOW LEVEL VOCs BY METHOD 8260B

Method: SW8260B

Prep Method: SW5030B_LL

Analyte	Result	Q	RL	Units	DF	Date Analyzed	Run Batch ID	Analyst
1,1,1-Trichloroethane	ND		5.00	µg/L	5	12/8/2004 4:31:00 PM	LINUS_041208A	DWW
1,1,2-Trichloroethane	ND		5.00	µg/L	5			
1,1-Dichloroethane	ND		5.00	µg/L	5			
1,1-Dichloroethene	ND		5.00	µg/L	5			
1,2-Dichloroethane	ND		5.00	µg/L	5			
1,2-Dichloropropane	ND		5.00	µg/L	5			
Benzene	ND		5.00	µg/L	5			
Carbon tetrachloride	0.750	J	5.00	µg/L	5			
Chloroethane	ND		5.00	µg/L	5			
Chloroform	ND		5.00	µg/L	5			
cis-1,2-Dichloroethene	ND		5.00	µg/L	5			
Ethylbenzene	ND		5.00	µg/L	5			
m,p-Xylene	ND		5.00	µg/L	5			
Methylene chloride	ND		10.0	µg/L	5			
Naphthalene	ND		5.00	µg/L	5			
o-Xylene	ND		5.00	µg/L	5			
Tetrachloroethene	0.995	J	5.00	µg/L	5			
Toluene	ND		5.00	µg/L	5			
trans-1,2-Dichloroethene	ND		5.00	µg/L	5			
Trichloroethene	155		5.00	µg/L	5			
Vinyl chloride	ND		5.00	µg/L	5			
Surr:1,2-Dichloroethane-d4	102		70 - 130	%REC	5	12/8/2004 4:31:00 PM	LINUS_041208A	DWW
Surr:4-Bromofluorobenzene	95		70 - 130	%REC	5			
Surr:Toluene-d8	94		70 - 130	%REC	5			

Definitions:

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DF - Dilution Factor

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N - Single Column Analysis

NP - Petroleum Pattern is not present

B - Analyte found in Method blank

DNI - Did not Ignite

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